COMMERCIAL FERTILIZER

CONSOLIDATED WITH THE FERTILIZER GREEN BOOK

DEEP FEEDING of CORN

Excellent results are being obtained in the Midwest, by deep plowing or drilling of 500 to 1,000 pounds of 8-8-8 or 10-10-10 fertilizer per acre before planting corn.

When these nitrogen-rich fertilizers are placed down deep in soil moisture where corn roots feed, the plant foods keep corn green and growing throughout the season and produce an abundance of well-filled, plump ears. The crop matures earlier and yields many more bushels of better quality corn with a much higher protein content.

Shown below are the results of a fertilizer test in which this method of application was used:

NITROGEN makes the difference!

Left: Corn fertilized with 100 pounds each of nitrogen, phosphorus and potash—equivalent to 1,000 pounds of 10-10-10 per acre.

Actual yield: 99 bushels of shelled corn per acre.

Right: Corn fertilized with 100 pounds each of phosphorus and potash—but NO NITROGEN.

Actual yield: 57 bushels of shelled corn per acre.

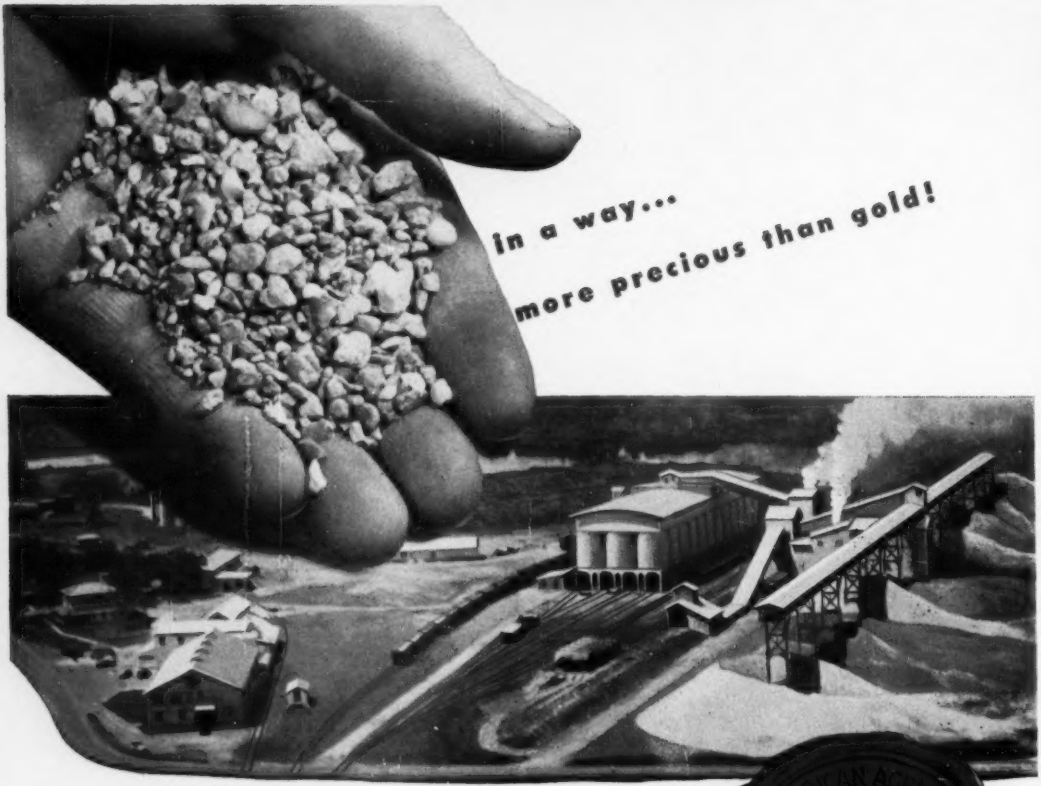
100 pounds of nitrogen increased the corn yield 42 bushels per acre—and improved quality of the entire crop.

Note: All corn received starter fertilizer in addition to the plowdown fertilizer indicated.

THE BARRETT DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 RECTOR STREET, NEW YORK 6, N. Y. • RICHMOND 19, VA.* • SOUTH POINT, OHIO
HOPEWELL, VA. • ATLANTA 3, GA. • COLUMBIA 1, S. C. • SAN FRANCISCO 3, CAL.
*Reg. U. S. Pat. Off.

Barrett NITROGEN*

THE ELEMENT THAT MAKES PLANTS GROW!



Air view showing dryers and rock storage at Pierce, Florida, headquarters of A.A.C. phosphate mining operations. (Top) Sample of Florida Pebble Phosphate Rock, source of phosphorus widely used in the chemical industries, in its elemental form as well as in phosphoric acid, phosphates and phosphorus compounds. ¶ This pebble rock is also the principal source of the most important—and most generally deficient—plant food element. Often called the Key to Life, phosphorus is essential in maintaining and improving crop yields. Health, growth, life itself, would be impossible without phosphorus . . . so in a way these phosphate pebbles are more precious than gold.

AA Quality...

for over 85 years a symbol of quality and reliability

principal AA QUALITY products

All grades of Florida Pebble Phosphate Rock **AA QUALITY Ground Phosphate Rock**
All grades of Complete Fertilizers **Superphosphate**
Gelatin **Bone Products** **Salt Cake** **Ammonium Carbonate**
Sulphuric Acid **Fluosilicates** **Insecticides and Fungicides**
Phosphoric Acid and Phosphates **Phosphorus and Compounds of Phosphorus**

THE AMERICAN AGRICULTURAL CHEMICAL COMPANY

GENERAL OFFICE: 50 CHURCH STREET, NEW YORK 7, N.Y.

30 FACTORIES AND SALES OFFICES, SERVING U. S., CANADA AND CUBA—ASSURE DEPENDABLE SERVICE

Complete Service

Lion provides one-stop nitrogen service to Southern fertilizer manufacturers

Lion Nitrogen Fertilizer Materials:

LION ANHYDROUS AMMONIA—Manufactured in Lion's modern plant to an 82.25% nitrogen content under accurate chemical control, the uniformity and high quality of this basic product are assured.

LION AQUA AMMONIA—This product is available to manufacturers for use in the formulation of mixed fertilizers or for sale as direct application material. Normally about 30% ammonia, its content can be controlled by order to suit your needs.

LION NITROGEN FERTILIZER SOLUTIONS—Made specifically for the manufacturing of mixed fertilizers, these products supply both ammonia nitrogen and nitrate nitrogen in the ratios desired. They are easily handled and available in three types designed for varying weather conditions, and for formula requirements in the production of fertilizers that cure rapidly, store well and drill evenly.

LION AMMONIUM NITRATE FERTILIZER—The improved spherical white pellets in this product contain a guaranteed minimum of 33.5% nitrogen. They flow freely, resist caking and store much better. Lion Ammonium Nitrate Fertilizer is shipped in 100-pound, 6-ply bags with two moisture-proof asphalt layers.

LION SULPHATE OF AMMONIA—This new, superior-type sulphate is guaranteed to contain a minimum of 21% nitrogen. Through special conditioning of the larger crystals, moisture and free acid content is greatly reduced. These factors, together with the special coating applied, make for greater resistance to caking in shipment or in storage. This product flows freely. It is shipped in bulk and in 100-pound, 6-ply bags laminated with asphalt.

Serving Southern States

Technical advice and assistance to fertilizer manufacturers in solving their manufacturing problems is available for the asking...just write.

LION

LION OIL COMPANY

Chemical Division • El Dorado, Arkansas

Two completely equipped EXACT WEIGHT Sacking Scales at work in the Jackson Fertilizer plant.

Save a Business Life – Yours !

A critical need exists for higher productivity and better cost and quality control to offset steadily rising costs, sharp competition and flimsy profit margins and the need is urgent. Better planning and equipment is needed. High on the priority list of equipment are scales . . . *the right kind in the right place*, for good scales are the very heart of any processing and packaging operation from precision ingredient compounding to final check-weighing of the finished packaged goods. No operation today can stand a loss due to failure in ingredient compounding from laboratory procedure through large scale production. No operation can absorb packaging shrink from bulk to bag. You cannot package even a part of those already paper thin profits now. From raw materials to shipping docks alert engineers are pin pointing every spot where adequate weighing units will save money, increase production and speed up operation. Saving business lives today is a very active engineering job and no division of EXACT WEIGHT Scales is busier than our own engineering department. Why don't you avail yourself of this know how for your business.

SALES and SERVICE
in all Principal Cities
from Coast to Coast
and Canada.

EXACT WEIGHT SCALES
Industrial Precision
THE EXACT WEIGHT SCALE COMPANY

906 W. Fifth Avenue • Columbus 8, Ohio
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200 pounds of Ammonium Sulphate step up corn yield 18 to 20 bushels for Earl L. Hanson

PROPHETSTOWN, ILL.

Mr. Hanson gives Ammonium Sulphate the credit for a sizable increase in his corn yield. Last year, he sidedressed approximately 200 pounds of Ammonium Sulphate per acre in addition to his usual row fertilizer. The result was an extra 18 to 20 bushels of corn per acre.

Bigger yields for farmers mean better business for you

● Whether U·S·S Ammonium Sulphate is applied directly as a straight nitrogen material or included in high-analysis mixed fertilizers, the farmer benefits. And, as more and more farmers learn of its advantages, demand for this nitrogen material goes up and up.

You can cash in on this demand in two ways: First, by mixing U·S·S Ammonium Sulphate into your complete fertilizers and telling your customers about its advantages. Second, by offering your customers U·S·S Ammonium Sulphate in 100-pound bags for direct application.

The spring fertilizer season is just around the corner, so make plans now to get your share of this business. For complete information on U·S·S Ammonium Sulphate for high-analysis mixed fertilizers or direct application, contact our nearest sales office or write directly to United States Steel Company, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

U·S·S AMMONIUM SULPHATE

USS TRADE MARK

UNITED STATES STEEL

COMMERCIAL FERTILIZER

ESTABLISHED 1910

February, 1952

Vol. 84 No. 2

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Published Monthly by

WALTER W. BROWN PUBLISHING CO., INC.

75 Third St. N. W., Atlanta, Georgia Phone Atwood 4160

ERNEST H. ABERNETHY, *President*

BRUCE MORAN, *Editor* V. T. CRENSHAW, *Business Manager*

Subscription rates: United States, $3.00 per year. Foreign $5.00 per year.

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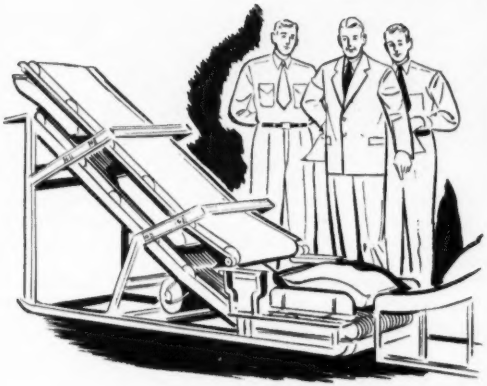
COMMERCIAL FERTILIZER, entered as second class matter, October 12, 1910, at the post office at Atlanta, under the Act of March 3, 1879. Published monthly except semi-monthly in September, by Walter W. Brown Publishing Co., Inc., 75 Third St., N. W., Atlanta Georgia.

NO. 4 OF A SERIES

ON HOW TO

Stretch a MULTIWALL Paper Bag

Kraft paper supplies are short. So it is important for you to get the best use from your multiwalls. Here are a couple of good ways to stretch them . . .



USE THE EXPERIENCE OF BEMIS SALESMEN AND SERVICE MEN

From installation of equipment to car-loading, Bemis men can often give money-saving help. Here is an actual case:

A mill complained that multiwalls were breaking going through the bag flattener. A Bemis Salesman found that—

1. The chute from the valve packer was too steep. The bags hit the flattener rolls too fast.
2. An obstruction in the chute made small cuts in the bag.
3. The guide rails were too far apart so some bags entered the rolls on the diagonal.

The causes of trouble were eliminated . . . everybody benefited.

USE A BEMIS SEWING MACHINE CLINIC

These clinics are informal instruction periods conducted by specially trained Bemis experts for plant personnel who supervise and use bag closing sewing machines. There are demonstrations and discussions on sewing machine operation and maintenance. Motion pictures show efficient installations, the dismantling and reassembling of sewing heads, etc.

Bemis specialists also assist in planning production line changes . . . and they will recommend new types of equipment, describe latest methods, or help you with special packaging problems.

Want the Whole Story?

Ask your Bemis Man for a copy of the illustrated Bemis Multiwall Packing Guide. It deals with Storage, Filling and Closing, Handling, Palletizing and other important subjects that will help you make your multiwall bags serve you better.

• • •

Maybe Cotton Bags are Your Answer . . . if you can't get all of the multiwalls you need. Cotton bags are available . . . and Bemis is the leading cotton bag source.

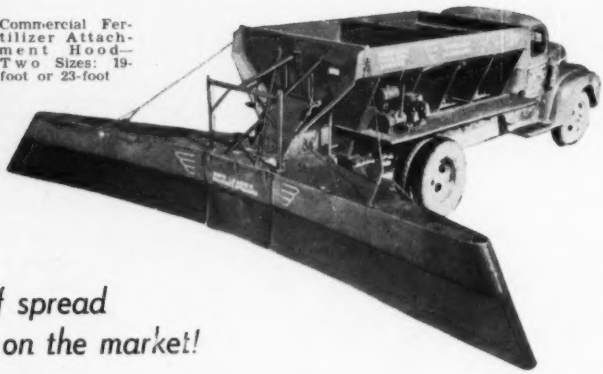
Bemis

BEMIS BRO BAG COMPANY

St. Louis 2, Missouri

Here's the answer to your Spreading Problems!

AGAIN! "The NEW LEADER" leads the field



Commercial Fertilizer Attachment Hood—Two Sizes: 19-foot or 23-foot

with its new "Motor-Driven Spreader" offering greater accuracy of spread with the most positive feed on the market!

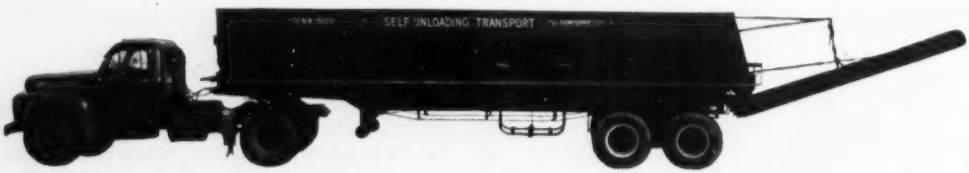
SPECIAL ADVANTAGES— Uniformity of spread is not dependent on truck speed. Motor is mounted on catwalk and drives only the twin distributor discs at a constant speed, assuring full width of spread at all times together with uniform distribution.

Conveyor is separately driven from truck drive shaft by a series of V-belts to deliver the correct amount per acre—regardless of truck speed or regardless of whether the truck is driven in low, super-low or any other gear.

Conveyor speed is, therefore, positively synchronized with speed of the rear wheels of truck and at each revolution of the rear wheels, the conveyor moves a given distance regardless of the truck's speed. Amount of material delivered by conveyor does not vary with hilly or soft field conditions.

Spreader Body Lengths (inside measure) are 9', 11', 13' and 15'. Other body lengths on special order.

Note: When Spreading Attachment is folded up for road-traveling position, width is approximately 7'-5"



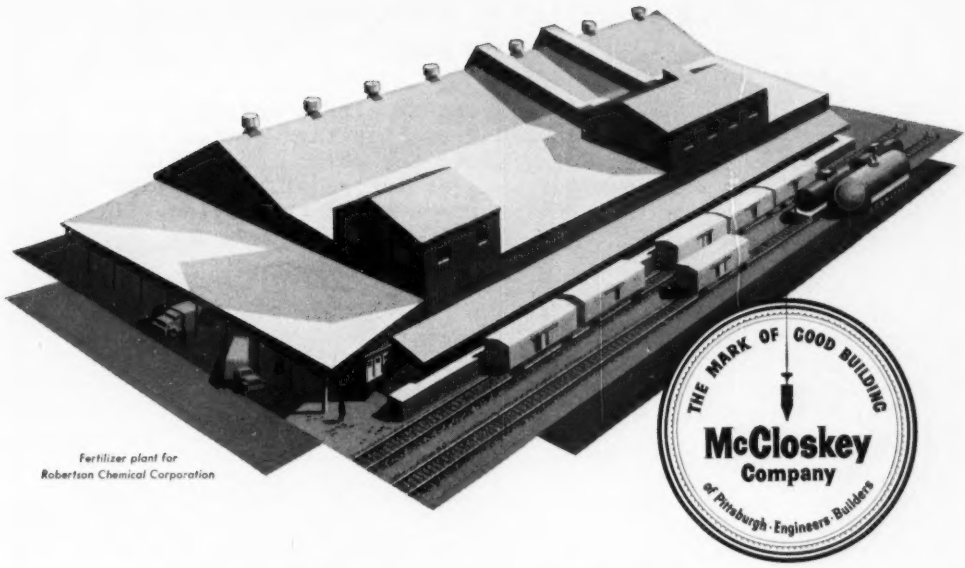
"The NEW LEADER" Self-Unloading Bulk Transport

The 20-ton capacity transport above is shown with elevator in place and ready to load a NEW LEADER Spreader truck. These units are proving very profitable; in bad weather they eliminate demurrage on railroad cars; fertilizer gets to the job quickly and spreader trucks can be kept working in the field. The transport, being a self-unloading unit, leaves the tractor truck free to return to pick up another transport load. These units have four individual compartments of 5 tons each. Each compartment may be unloaded independently of the others. Compartments and rear endgate are removable so that bagged and packaged goods may be hauled instead of bulk loads. Capacity 5 tons to 25 tons, lengths from 11 ft. to 40 ft. Written warranty with all NEW LEADER equipment. Write today for specifications, prices, etc. Fast delivery service sells fertilizer!

FREE! Write for "The Story of a Custom Fertilizer Spreading Service".

HIGHWAY EQUIPMENT COMPANY, INC. CEDAR RAPIDS, IOWA

MANUFACTURERS OF THE WORLD'S MOST COMPLETE LINE OF SPREADERS



Fertilizer plant for
Robertson Chemical Corporation

You Get Sound Design, Efficient Construction With McCloskey Fertilizer Plants

The design of your plant is based upon sound engineering principles when you retain McCloskey to plan and erect your new fertilizer processing unit. For, back of "The Mark of Good Building" is the experience gained in designing a number of fertilizer plants which is reflected in our modern approach to the many specialized problems involved in such an operation.

The design helps combat the destructive effects of corrosion—ample room for overhead conveyors is provided by elimination of outdated truss construction—high stacking of material is made practicable—the need for a plant of eccentric shape is provided for. All these vital elements of design are included in your plant when you retain McCloskey to plan and develop your expansion program.

The construction of your new plant gets under way fast when directed by our field engineers. They employ many cost-reducing and time-saving methods that mean your plant is ready for operation faster, your total investment is less than you would expect. You have no details to worry about, the entire project is covered by your one contract with McCloskey.

Some of the best names in the fertilizer industry use McCloskey design and construction service again and again in planning and completing their expansion programs. It will pay you, while your plans are still in the thinking stage to draw upon our experience—you will find it invaluable. Without obligation, we invite you to ask for a consultation. Write McCloskey Company of Pittsburgh, 3412 Liberty Ave., Pittsburgh 1, Pennsylvania.

McCloskey Company

of Pittsburgh

Engineers - Builders

JUST AROUND THE CORNER

BY VERNON MOUNT

Robin Hood could have been elected to almost anything he chose, if the poor had had the franchise then--because he stole from the rich and gave it to the poor. The Robin Hood principle...it was unprincipled, so let's call it "method"... has been a success in politics for a whole generation. It is with us again.

Promises of beneficences will run rampant. Wages for workers, supports for farmers, more generous old-age pensions...something for every big group of voters. "Promises", I said. Congress will drag its feet about most of them--but Congress needs votes, too. As I said last month "Profit is another story"...watch Truman's messages and you'll see why.

Yours faithfully,

Vernon Mount

DAVIDSON-KENNEDY CO.

Is now manufacturing a complete line of fertilizer equipment in addition to their well established oil mill machinery business.

Cluster Hoppers
Foot Breakers
Elevating & Conveying Equipment
Head Breakers
Double Deck Shaker Screens
Automatic Ammonia Weighing Systems
Pulverizers
Batch Mixers

We Welcome Your Inquiries

Write for Information

1090 Jefferson St., N. W. Atlanta, Georgia

THE RAYMOND BAG COMPANY
Middletown, Ohio
Raymond Representative
Here's the man you want to meet if you pack or ship commercial fertilizers—the Raymond Representative.
He has behind him the experience of a company that has specialized in making Paper Shipping Sacks for more than fifty years. He can show you the most practical and economic way to pack and ship your fertilizers. He is ready to serve you at all times. A phone call, letter, or telegram will bring you his services without obligation.
There is a Raymond Multi-Wall Paper Shipping Sack ideally suited to the particular requirements of your product. These dependable Shipping Sacks are CUSTOM BUILT of heavy, specially prepared Kraft paper in many different sizes, types, and strengths. They are made with valve or open mouth, sewn or pasted, printed or plain.
THE RAYMOND BAG COMPANY
Middletown, Ohio
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R
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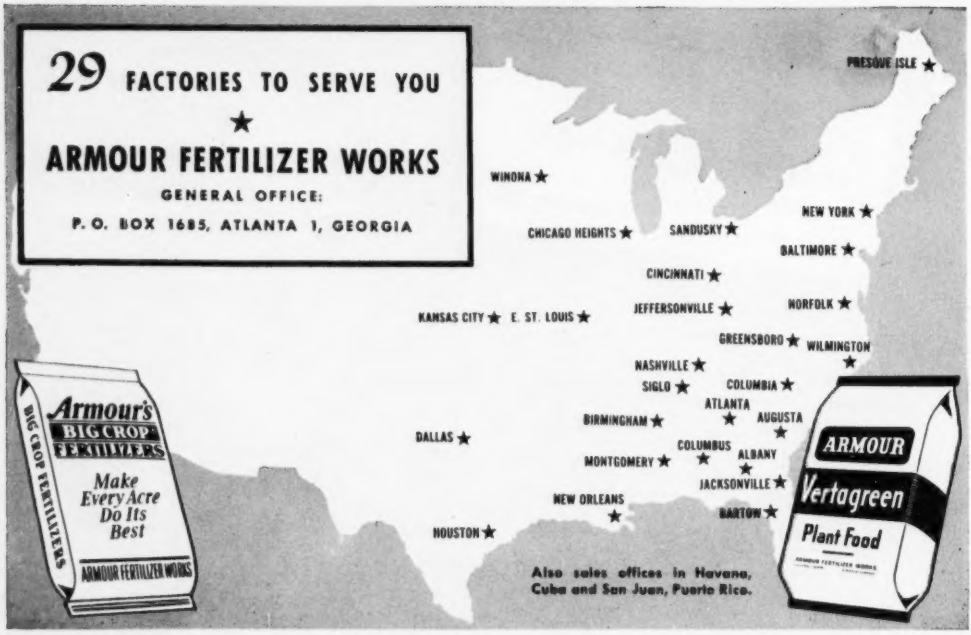

MENTE BAGS ARE WAY OUT IN FRONT !

Dept. B1

Write, wire or phone for latest quotations on Burlap—Cotton —New—Used Bags.

MENTE & CO., INC.

ISAAC T. RHEA, Pres.

Box 1098
Savannah

Box 690
New Orleans

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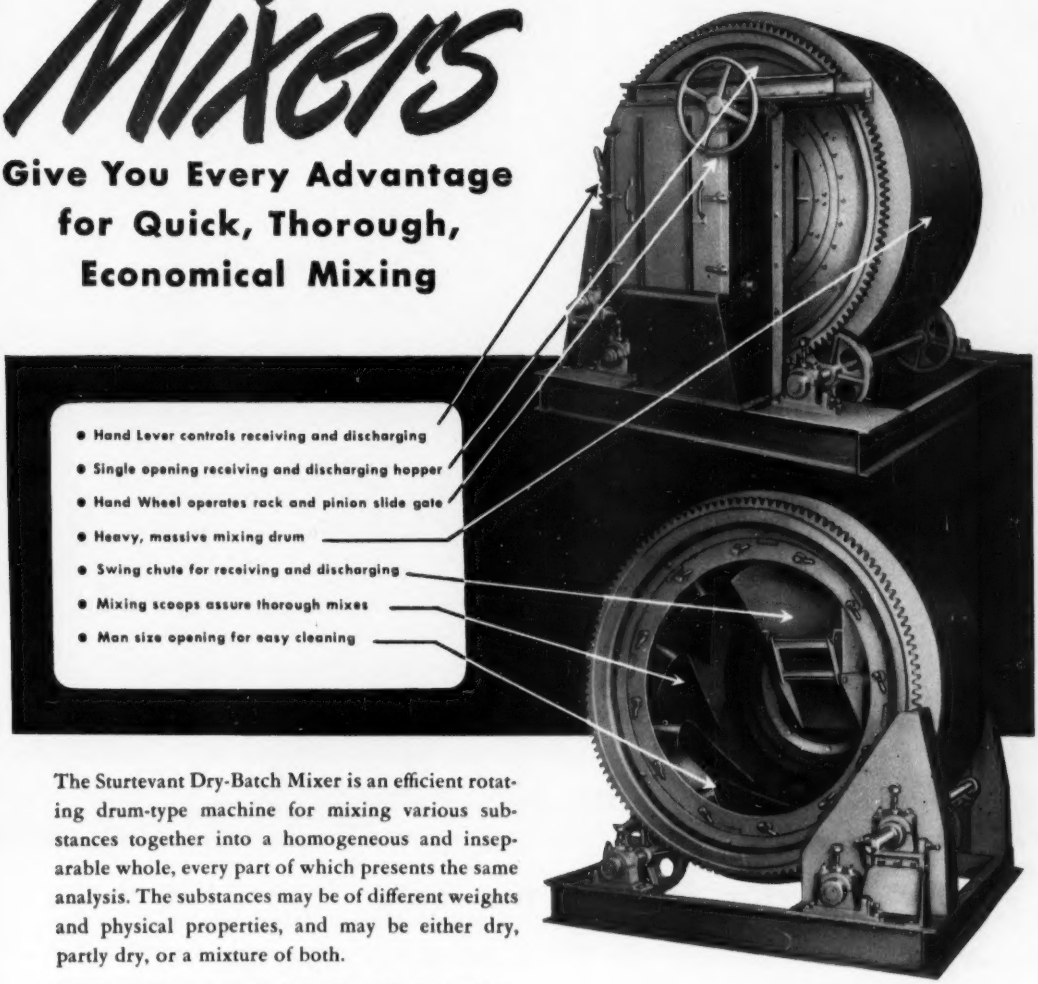
Houston

Sturtevant Dry Batch

Mixers

Give You Every Advantage for Quick, Thorough, Economical Mixing


• Hand Lever controls receiving and discharging
• Single opening receiving and discharging hopper
• Hand Wheel operates rack and pinion slide gate
• Heavy, massive mixing drum
• Swing chute for receiving and discharging
• Mixing scoops assure thorough mixes
• Man size opening for easy cleaning

The Sturtevant Dry-Batch Mixer is an efficient rotating drum-type machine for mixing various substances together into a homogeneous and inseparable whole, every part of which presents the same analysis. The substances may be of different weights and physical properties, and may be either dry, partly dry, or a mixture of both.

Because of the unique design of its mixing chamber, and the 4-way mixing action which brings two or more substances together, the Sturtevant Dry-Batch Mixer does a more rapid mixing job than other machines and, at the same time, it is complete and thorough in every particular.

Write for bulletin today.

STURTEVANT MILL COMPANY

111 Clayton Street, Boston 22, Mass.

Designers and Manufacturers of:

CRUSHERS • GRINDERS • SEPARATORS • CONVEYORS
ELEVATORS • MIXERS
MECHANICAL DENS and EXCAVATORS

Compare These Advantages

- Only one lever controls both receiving and discharging for simplicity of operation. Hand wheel operates rack and pinion slide at feed opening.
- 4-way mixing action speeds production...assures thorough blends.
- "Open-door" accessibility permits easy, fast, thorough, cleaning.
- Single aperture drum for both intake and discharge.
- Unusually efficient scoops pick up materials to effect thorough mixing as drum revolves.
- 5 models . . . a size for every mixing job . . . smallest size mixes up to 7½ tons per hour . . . largest size up to 75 tons per hour.

Her fingertips imagine the taste

The lady doesn't trust her eyes alone.

The buyer of Multiwalls is in much the same position.

Aside from package design, it's hard to tell one manufacturer's bag from another's simply by looking at it or fingering it.

Put the bags out of sight and you may be able to see many differences.

Men who buy 85 per cent of all Multiwalls consider* these intangibles more important than any other factor when they choose their supplier.

Invariably, these are among the first questions they ask . . .

"Is this company big enough?"

"Do they have a fair allocation policy?"

"Are their prices competitive?"

"Do they respect delivery dates?"

In a nutshell—

"Are they good people to do business with?"

We can't tell you what the answers are when these Multiwall users consider Union. This we do know . . . and the inference is yours to make—

In these days of industrial pressure, when *dependability* is a fervent wish as well as a word, men to whom Multiwalls are important are placing an increasing share of their orders with Union.

More so every day . . .

IT'S UNION FOR MULTIWALLS

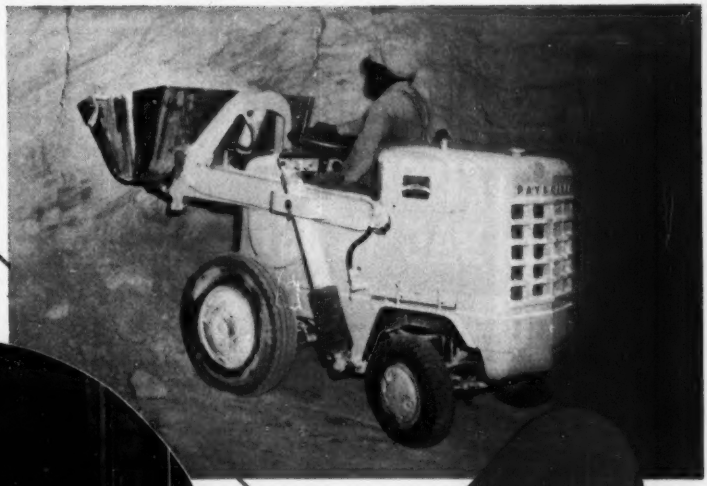
TRADE MARK UNION

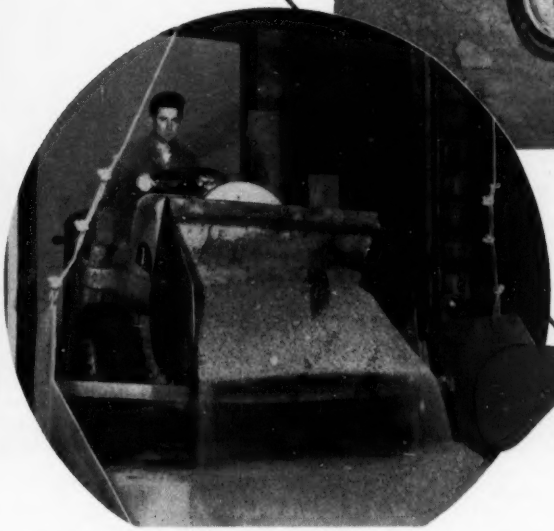
*August, 1951 research study.

UNION BAG & PAPER CORPORATION • NEW YORK: WOOLWORTH BUILDING • CHICAGO: DAILY NEWS BUILDING

Superphosphate, hardened in the bins, is tough to dig. But the PAY-LOADER is equal to the job.

PAYLOADER in the box car unloads bulk materials fast, easily, and at low cost.





TOUGH

or Easy

PAYLOADERS *Move Materials at* LOW COST

Hundreds of "PAYLOADERS" are in use in all kinds of industries, handling all sorts of bulk materials. They dig full bucket loads quickly from bins of hardened superphosphate as well as scoop up free-flowing or lumpy chemicals and other materials . . . carry their loads rapidly through yards, doorways and aisles and deposit them neatly in bins, piles, hoppers or chutes. They unload box cars of bulk materials fast and cheaply, dashing in and out of car doors delivering their loads to nearby or distant points.

The use of "PAYLOADERS" is so widespread that a tremendous amount of application experience has been accumulated so that accurate production and cost figures can be estimated for new applications. You are invited to find out how the "PAYLOADER" can boost production and cut material handling costs in your plant as they have in so many others. The Frank G. Hough Co.
702 Sunnyside Ave., Libertyville, Illinois.

HELP for your material handling problems is in the pages of "Industrial Handling," the free Hough magazine. Catalogs on any size "PAYLOADER" (12 cu. ft. to 1½ cu. yd.) are also available, without obligation.

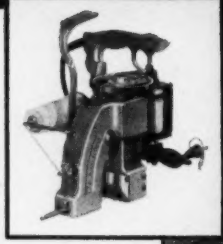
SAY "HUFF"

PAYLOADER®

THE FRANK G. HOUGH CO. • Since 1920

OVER 4000 USERS are cutting closing costs

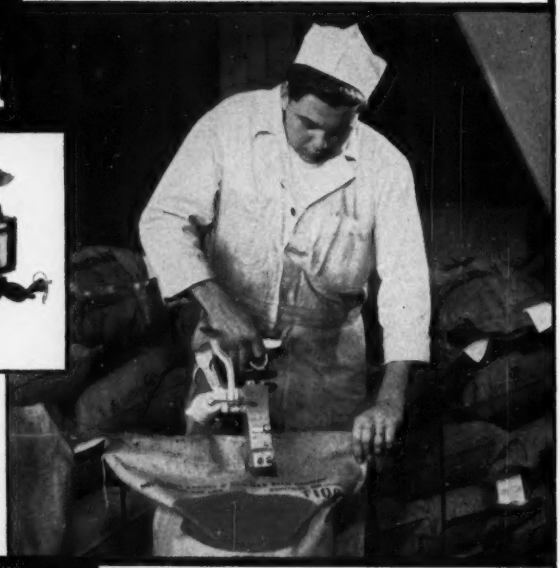
with the **FISCHBEIN** *Portable* **BAG CLOSER**



- Entirely portable . . . weighs only 10½ pounds
- Requires no installation, supports or plant space . . . merely plug into any electrical outlet
- Handles all types of textile bags and most paper bags
- Economical to use . . . economical to buy!
- *Unconditionally guaranteed!*

The FISCHBEIN *Portable* BAG CLOSER has been thoroughly proved to be practical, reliable and efficient in both large and small plants, for continuous or occasional use. It is being used profitably in every part of the world under various operating conditions, and on a great variety of bags. IT CAN SOLVE YOUR BAG CLOSING PROBLEMS, TOO!

ADDRESS INQUIRIES TO:



DAVE FISCHBEIN CO. *Industrial Sewing Machinery*

Dept. 3-D 38 Glenwood Avenue, Minneapolis 3, Minn.

POTASH

See us for your requirements of

IMPORTED MURIATE

Woodward & Dickerson Inc.

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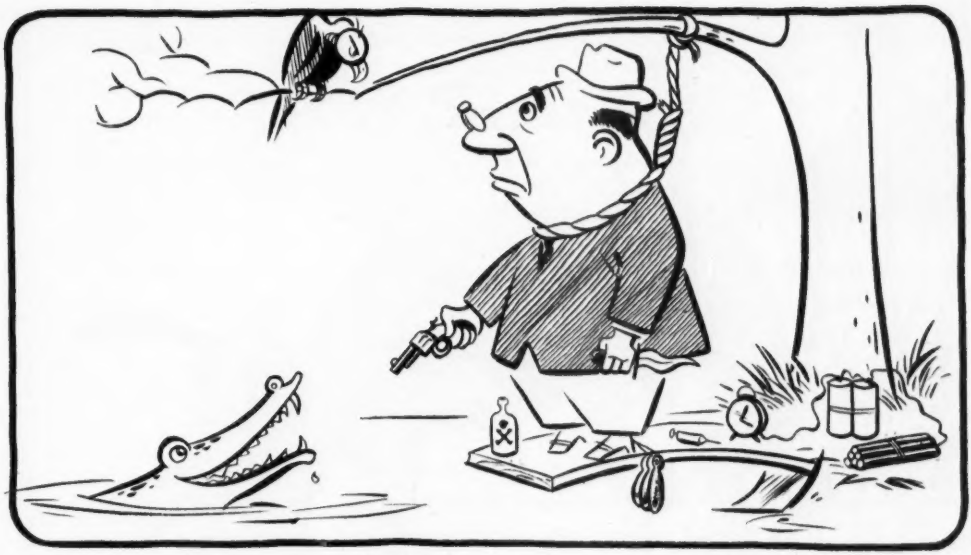

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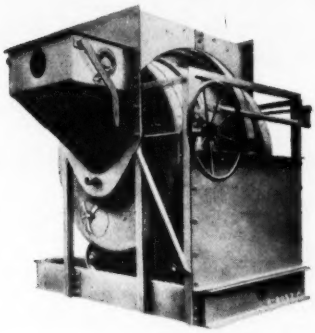

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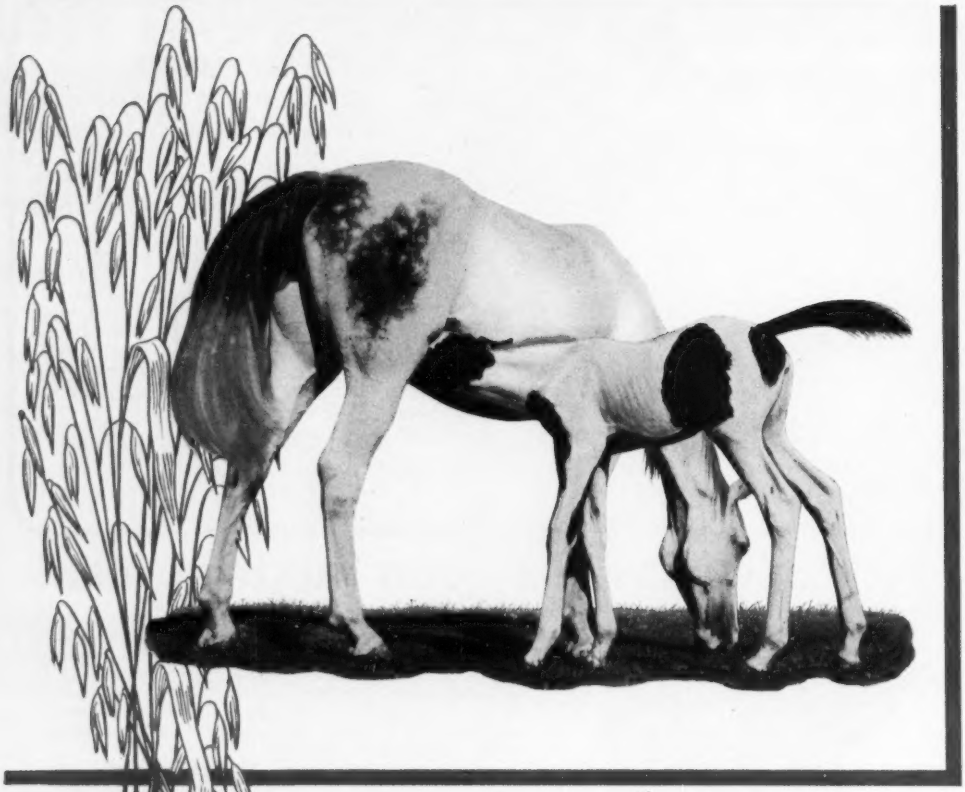

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DPA Sulphur And Nitrogen 1955 Goals

Defense Production Deputy Administrator Ralph S. Trigg in January released domestic production goals for the year 1955 of 8,400,000 long tons of sulphur and sulphur equivalents; 2,930,000 short tons of contained nitrogen.

First National Land Judging Contest May 1-2

A national contest in land judging and appreciation, conducted along the lines of a livestock judging contest, will be held in Oklahoma City, May 1 and 2, with every state invited to send a 4-H team, and an adult team of judges.

The contest, first to be held on a national scale, is sponsored by WKY, an Oklahoma City radio station, the Oklahoma A. and M. college Extension Service, State Vocational Agriculture department, Soil Conservation Service, State Department of Agriculture and other agricultural agencies and groups.

Land judging schools have been held in Oklahoma for the past 11 years, and have proved a near sensation among both young and adult farmers. "The plan was patterned after the livestock people because they had a method of glamorizing the livestock business through their judging contests and shows," says Edd Roberts, Extension soil conservationist, who has trained 36,000 people in land judging and land appreciation schools the past 4 years.

"We know they can't become soil scientists or specialists by attending this school or contest," says Roberts, "but it gives the participants an appreciation of the land, what should be done, and what can be done."

Sandy Saunders WKY farm director has issued an invitation to all county agents, vocational agriculture teachers, soil conservation workers, veterans' teachers and others to enter the contest, which will be featured on the National Farm and Home Hour broadcast May 3, immediately after the contest closes.

It Seems to Me

by BRUCE MORAN

For a long time in these pages we have said that there was a need for closer coordination of the various forces which classify loosely as aides to the farmer. Our industry is pushing its equipment to capacity and beyond to satisfy a demand engendered by war-time and high prices for farm commodities.

But those two factors will not always be wth us, and an industry making twice the goods it did ten years ago will have a rude awakening unless steps are taken now.

It seems to me the state-level Plant Food Educational Society is the answer. As Billy Barton said in Athens the other day, these forces need to be "connected up". And the Plant Food Educational Society, embracing as it does the educators, the experiment stations, the manufacturers, salesmen and dealers, the suppliers, can do a job of connecting up, of relaying information from the field to the laboratory and test plot, and back again to the field.

So you may expect to hear a lot about this type of association in these pages from now on. We are going to preach the movement from the housetops.

INDUSTRY CALENDAR

Date	Organization	Hotel	City
June 16-18	NFA	Greenbrier	White Sulphur
June 19-22	APFC	Homestead	Hot Springs
April 6-9	NACA	Fairmont	San Francisco
Nov. 10-12	CFA	Desert Inn	Palm Springs

Corn PROTEIN SLIPPING

EXTRA NITROGEN—EXTRA BUSHELS—EXTRA PROTEIN

By WALTER S. COLVIN & DALE T. FRIDAY
THE BARRETT DIVISION
Allied Chemical & Dye Corporation

America is growing more corn on fewer acres—but generally speaking it is poorer corn. For the past decade, the protein content of corn has been slipping. This is a point of National concern for protein is one of the essential food nutrients for livestock, poultry and man.

CORN PROTEIN SLIPPING

As a matter of fact, within a few short years, the percent of protein in corn has dropped generally from about 9.5% to 8.5%. In many areas the decline has been even greater. Our Nation's feeders and dry millers have a right to be concerned. The economics are alarming.

Take the Illinois situation for example. Prof. E. B. Early and Dr. E. E. Turk state that "if the feed corn of the state of Illinois declined only one-half percent in protein, it would cost feeders $8,700,000 annually to replace it with soybean protein at 10¢ a pound.

A leading feed manufacturer estimates that when using soybeans as a supplementary source of protein, it costs 3¢ to 6¢ per bushel to raise corn for feeding purposes from 8.5% protein to 9.5% protein.

What happened? Why this lower protein corn? The explanation is very simple.

NITROGEN HUNGER LOWERS PROTEIN IN CORN

Briefly, Universal acceptance of high yielding hybrid corn, thicker planting, and more bushels per acre (10 bushels per acre increase during the past twenty years) has put a real drain on the corn belt soil. Heavy cropping has resulted in a diminishing supply of nitrogen in the soil. Consequently, less available nitrogen for more corn has resulted in lower protein corn. And each year, the situation becomes worse. Agricultural experts are fully aware of this situation. The matter is being given close attention by feeders, plant breeders, agronomists, fertilizer manufacturers and millers throughout the corn belt.

OHIO INVESTIGATING PROTEIN PROBLEM

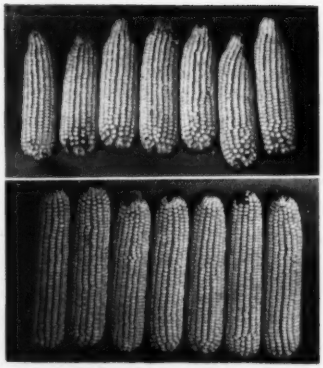
To obtain further information on the protein problem, some very interesting corn work was conducted in Ohio during 1949 and 1950. This particular project was under the joint sponsorship of Ohio State University, the State Extension Service and The Barrett Division, Allied Chemical & Dye Corporation.

In 1949 nitrogen demonstrations on corn were conducted on forty-three farms scattered throughout ten Ohio counties. Each demonstration consisted of a simple comparison between nitrogen plowed down before planting and no nitrogen. A complete fertilizer was used on all plantings at the usual farm rate. Nitrogen ("A-N-L" Nitrogen Fertilizer) was applied at the rate of 40 to 80 pounds per acre, depending upon soil fertility, cover crop, anticipated corn population, etc.

At harvest time, representative samples were taken from the nitrogen treated and non-nitrogen plots, yields were computed and protein determinations were carefully made. As a result of this work some very interesting data are available.

First of all, it was found that the protein content of corn varies greatly in Ohio. A low of 6.6% protein was recorded while one lot carried just under 13% protein. The protein content for all corn (with and without nitrogen) averaged 8.5%.

Corn grown on fields not receiving plow down applications of nitrogen averaged only 8.0% protein.



Corn above got no side-dressing. Yield 86.4 bushels with 8.18% protein. Corn below got 50 pounds of nitrogen side-dressing. Yield 113.1 bushels; 9% protein.

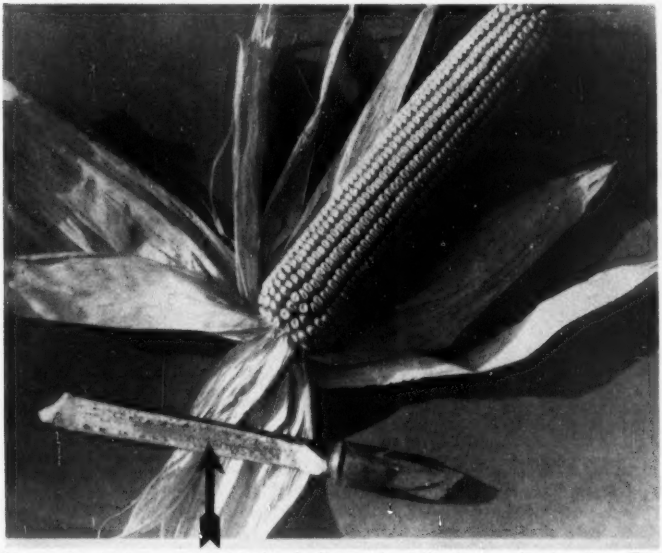
Where nitrogen was plowed down, the protein content was raised one percentage point to the 9% level. This is highly significant. The increase in protein content due to nitrogen varied greatly. A few lots showed little or no gain while others indicated 2, 3 and one even 4 percentage point gains.

EXTRA NITROGEN INCREASES PROTEIN IN CORN

As an example, the yield of corn on the Earl Beers Farm in Delaware County without plow down nitrogen was 80 bushels with a protein content of 8.80%. Forty pounds of nitrogen plowed down produced a 100 bushel corn crop carrying 12.92% protein. The increase in yield of protein amounted to 329 pounds per acre.

In another instance, a farm in Van Wert County produced 55.4 bushels of corn without extra nitrogen and 104.6 bushels per acre where 50 pounds of nitrogen was plowed down. But that is only half the story! The protein content of corn receiving nitrogen jumped from 7.40% to 9.46% or a gain of 2.06%. The protein output per acre rose from 228 pounds to 554 pounds.

Nitrogen side-dressing pays off best when a liberal application of a recommended complete fertilizer is used at corn planting time.



Tissue test shows an ample supply of nitrogen in stalk at corn ripening time. This is an indication of high protein corn.

Without nitrogen, another Van Wert County farm produced 43.5 bushels of corn per acre with a very low 6.66% protein content. Eighty pounds of nitrogen applied in addition to the starter fertilizer gave 27 extra bushels and increased the protein content by 1.84% boosting it to 8.5%.

The yield of protein on a Putnam County farm increased 224 pounds per acre where 60 pounds of nitrogen was plowed down before planting corn. The yield with and without nitrogen was 41.0 and 80.5 bushels respectively. The protein content increased from 7.1% to 8.6%, a gain of 1.5%. The extra protein resulting from this nitrogen application would be equivalent to that in eleven bags of a 20% dairy ration—a pretty good acre gain.

Orlin Culp, a successful farmer in Fayette County, plowed down 60 pounds of nitrogen per acre on his corn land. He increased his corn yield by 30 bushels per acre with a stepped up protein content of 1.02%.

In general, the greatest increase in protein content was experienced by farmers who reported larger gains in corn yield per acre. The figures show that where the gain was less than ten bushels per acre, the average gain in protein content was only 0.45%. Where the gain was over ten bushels per acre, the protein gain was over one percentage point. This is contrary to general thinking on this matter.

Unquestionably, other factors are involved besides nitrogen. Some other field tests showed, for example, that where no starter fertilizer was used at corn planting time, supplemental nitrogen did not increase protein content. In fact, in a few instances, nitrogen without sufficient phosphorus or potash brought about a reduction in protein. An adequate amount of phosphorus and potash must be available for maximum efficency of nitrogen.

The average increase in corn yields for 1949 trials amounted to 18 bushels per acre with an average increase of one unit of protein. And this is what we want—more corn, higher protein corn.

NITROGEN SIDE-DRESSING PAYS OFF

During 1950, the work started in 1949 was continued. Nitrogen tests were established in corn in nine Ohio counties. More emphasis was placed upon getting protein yields from fields having a heavy corn population. Also, on certain farms, the nitrogen was applied as a side-dressing while on other locations the nitrogen was plowed down.

Nitrogen Side-dressing Tests—Heavy Planting Rate

COOPERATOR	Plants Per Acre	Nitrogen Applied	Yield 15.5% Moist.	Yield Increase	Protein Content	Inc. in Protein
O. D. Grimes	12,870	No N	70.9		7.40%	
Ross County	15,288	40# N	100.1	29.2 bu.	8.07%	0.67%
Russell McGlone	10,780	No N	86.4		8.18%	
Scioto County	14,112	50# N	113.1	26.7 bu.	9.00%	0.82%
Richard Evans	16,660	No N	64.6		7.52%	
Champaign County	16,464	90# N	110.2	45.6 bu.	8.46%	0.94%

Nitrogen Side-dressing Tests—Low Planting Rate

COOPERATOR	Plants Per Acre	Nitrogen Applied	Yield 15.5% Moist.	Yield Increase	Protein Content	Inc. In Protein
Robert Jones	8.036	No N	87.1		10.48%	
Champaign County	9,898	45# N	100.5	13.4 bu.	11.61%	1.13%
O. A. Frederick	9,212	No N	61.7		8.65%	
Morrow County	9,408	45# N	70.4	8.7 bu.	9.90%	1.35%
R. A. Williams	10,192	No N	49.1		8.63%	
Richland County	10,192	40# N	58.1	9.0 bu.	10.07%	1.44%

First, let's consider the nitrogen side-dressing tests.

The data presented in the preceding table is highly interesting. First, the data clearly indicates that supplemented nitrogen applications not only brought about increases in yields but also stepped up the protein content. At the heavier planting rates, maximum efficiency resulted from the nitrogen side-dressing. The yield increases were rather outstanding. The old rule of one bushel of corn for two bushels of nitrogen was very evident. It is clearly indicated that both yield and protein content increased with additional amounts of nitrogen.

Forty pounds of nitrogen on the Grimes farm increased the yield 29.2 bushels and the protein content .67%. Compare this to the Richard Evans farm where 90 pounds of nitrogen jacked the yield 45.6 bushels and the protein content .94%. The protein analysis shown, however, are only about average and chances are additional amounts of nitrogen would have increased the protein content of the corn even more in the Grimes, McGlone and Evans tests.

Looking at the tests with the low planting rates we find very limited increases in corn yield. This is unquestionably due to the low plant population. There were simply not enough stalks per acre to make more bushels. On the other hand, since the nitrogen applied did not go into extra bushels it became less diluted and resulted in a greater increase in protein content of corn harvested. The protein content of nitrogen side-dressed corn on the Jones, Frederick and Williams tests were 11.61%, 9.90% and 10.07% respectively. These are very respectable figures, much above the average protein content for Ohio corn.

These nitrogen side-dressing tests further substantiate the fact that larger yields of high protein corn require both heavy planting and adequate nitrogen fertilization.

To be effective, nitrogen side-dressings must not be delayed too late in the season. On a farm in Madison County the nitrogen was applied August 7 and there was no increase in yield or protein content.

The University of Illinois has done some interesting work studying the influence of rate of planting and nitrogen applications on the yield and protein content of corn. This research was conducted by Prof. E. B. Early and Dr. E. E. Turk. Results of their studies are presented in the following table. You will note that even at the heavy planting rate both the yield of corn and percentage of protein in the corn were increased remarkably by the heavy applications of nitrogen.

Yield & Protein of Corn as Influenced by Rate of Planting & Soil Nitrogen Illinois—1948

Plants Per Hill and Per Acre	No N		80 Lbs. N.		160 Lbs. N	
	Yield	Protein	Yield	Protein	Yield	Protein
1 (3 920)	60	9.9	69	10.8	67	10.7
2 (7 841)	96	9.1	109	10.6	104	10.7
3 (11 761)	113	8.4	135	9.8	139	10.5
4 (15 682)	108	7.8	149	9.2	156	10.0
3 at 20" (23 522)	117	8.0	155	8.5	184	9.5

PLOW DOWN NITROGEN BOOSTS PROTEIN YIELD

Plow down applications of nitrogen in 1950 were effective in increasing both the yield and protein content of corn. To illustrate, 80 pounds of nitrogen was plowed down with a grass sod on the Virts Brothers farm in Champaign County. The corn population was over 13,000 stalks per acre. Eighty pounds of nitrogen raised the yield from 93.6 to 124.6 bushels, a difference of 31 bushels on the plus side. The protein content moved up 9.1% to 9.8% where the nitrogen was applied. Other tests indicated the same general pattern.

In general, it was found that the protein content of corn, both with and without nitrogen was higher on fields where a legume was plowed under. For example, on seven different farms where alfalfa or some other legume was turned down, the average protein content of the corn without supplemental nitrogen was 10.26%.

Where additional nitrogen was applied, the protein content was increased by ¾ unit and the average hit 11%. On the Allen County farm 60 pounds of nitrogen plowed under with alfalfa sod increased the pro-

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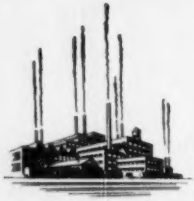

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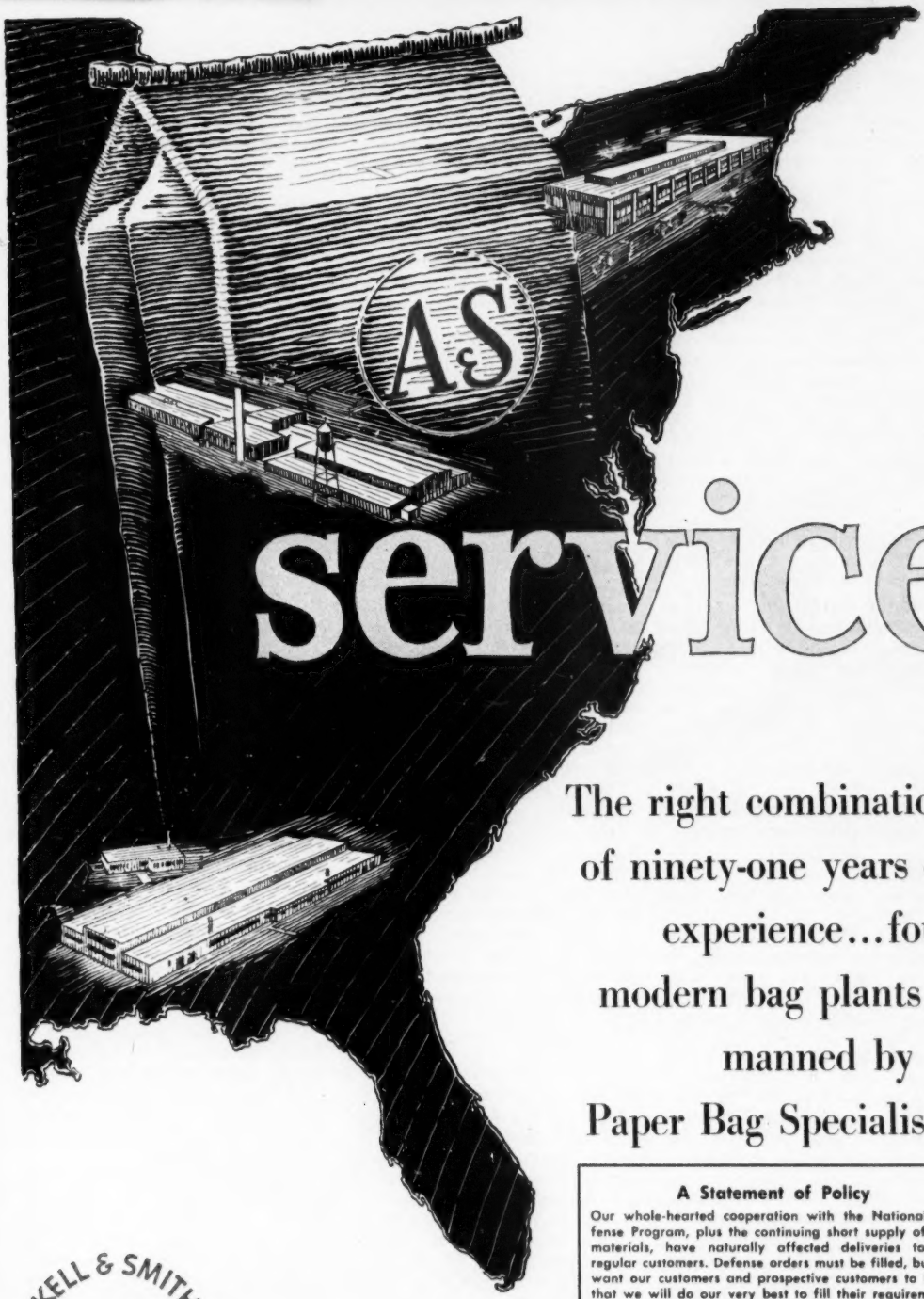

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tein content from 9.42% to 11%. In another Allen County test, 20 pounds of nitrogen applied on an alfalfa sod before plowing increased the protein content of corn from 9.5% to 10.75%—a gain of 1.25%. Dale Hertel, in Allen County, turned under eight tons of manure with a good legume sod for one of his corn plantings. On one section of this 40 pounds of nitrogen was applied along with the manure. The corn population was over 13,000 stalks per acre. Extra nitrogen increased the yield by 28 bushels and raised the protein content from 9.07% to 10.68%, a gain of 1.61%, representing a gain of 222 pounds of protein per acre. On this particular field, the yield without nitrogen was 58.4 bushels and 86.4 bushels with nitrogen. The extra nitrogen really paid off on this legume sod resulting in both more and better corn.

When the soil fertility was good enough to produce 11.0% of better protein corn, additional nitrogen did not materially increase the protein content even where the plant population was relatively low. This would probably not have been true if hybrid corn bred for a high protein content had been used.

CORN PROTEIN INCREASES WITH IMPROVED SOIL FERTILITY

These 1949-50 corn tests in Ohio tie in very nicely with some work done earlier by Dr. Dave Beard, formerly an Ohio Extension Agronomist and now with the U.S.D.A. In 1948 he reported that "a total of 28 samples gathered from Ohio corn crops averaged 8.5% protein or nearly the same as those reported from the 1946 crop." He further reported that the range of protein content varied from 5.9% to 10%. The lowest protein content came from corn following nitrogen starved brome grass sod while "highest protein content, 10%, came from corn following a good ladino clover green manure crop supplemented with 40 pounds of chemical nitrogen." He concluded that "extra bushels of corn loaded with extra protein can be produced by putting the necessary raw material nitrogen at the disposal of the corn crop."

Prof. W. L. Burlison, Head of the Department of Agronomy at the University of Illinois, writes that "soil fertility affects protein content of corn." One open-pollinated variety and 17 hybrids averaged 9.85% protein on good soil and 7.42% on poor soil in one of the University tests.

HIGHER PROTEIN CORN HAS GREATER FEEDING VALUE FOR RUMINANTS

Since about 85% of the corn crop is fed on the farm, feeders naturally raise the question. "does the extra protein in corn resulting from nitrogen fertilization have the same feeding value as the protein in ordinary corn?" For feeding ruminants where nitrogen is important (cattle, sheep and goats) the answer is definitely yes. Prof. Early and Dr. Turk write "12% protein corn would be worth 9½ million dollars more annually to Illinois feeders of beef cattle, dairy cattle and sheep than 10% protein corn. The value of high protein corn for swine and poultry will not be known until extensive feeding tests now underway have been completed."

NITROGEN GROWS MORE BUSHELS—BETTER BUSHELS

How can farmers increase both the yield and protein content of corn? First, where possible, plan to plant corn following a good strong sod—preferrably a legume. Broadcast and plow under 40 to 80 pounds of nitrogen, depending upon conditions. If supplies of available phosphorus and potash are relatively low, it pays to plow under recommended amounts of a high nitrogen complete fertilizer such as an 8-8-8 or 10-10-10 instead of a straight nitrogen material.

Band 300 to 400 pounds of a complete fertilizer recommended for corn at planting time. If supplemental nitrogen is not applied before plowing, plan to side-dress corn with 40 to 100 pounds of nitrogen per acre, depending upon corn population, type of sod, soil conditions, etc. Nitrogen side-dressings should be made before the corn is waist high. Leading farmers now realize that when they fertilize their corn crop with extra nitrogen they are shooting with both barrels. One, for extra bushels and two, for better corn—higher protein corn.

Midwest Soils Meeting February 22

Latest developments on fertilizer research in the Middle West will be discussed by soils specialists from 13 states at the annual meeting of agronomists and fertilizer industry representatives to be held at the Palmer House in Chicago, on Friday, February 22.

The soils men will be welcomed by J. D. Stewart, of Louisville, president, and Z. H. Beers, Chicago, executive secretary, of the Middle West Soil Improvement Committee, which is sponsoring the meeting.

Dr. Garth Volk, head of Ohio State University's agronomy department will preside.

Among research men presenting reports will be F. W. Smith, Kansas State College; W. P. Martin, Ohio State University; George Stanford, Iowa State College; E. B. Norum, North Dakota University; H. F. Rhoades, University of Nebraska; K. C. Berger, University of Wisconsin; and R. L. Cook, Michigan State College. Reports will also be presented by soils men from Indiana, Missouri and South Dakota.

These reports will cover fertilizer work on wheat, oats and corn; fertilizing pastures; corn and rotations; time, rate and method of applying fertilizer; effect of climate on the response of small grains to phosphate fertilizer; prospective nitrogen needs in the years ahead; plant nutrient deficiency symptoms; effect of heavy fertilization on the maintenance and persistence of legume-grass seedings.

There will be a question and answer period during the afternoon session followed by a report compiled by the agronomists covering recommendations of fertilizer grades for each state in the year beginning July 1, 1952.

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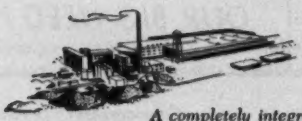

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GEORGIA ORGANIZES EDUCATIONAL SOCIETY

1. Malcolm Rowe, Rowe Warehouse and Fertilizer Co., Athens, president. 2. Dr. C. C. Murray, University of Georgia, with the chart of the College of Agriculture which he explained. 3. W. D. "Billy" Barton, Tennessee Corp. 4. Ray King, Georgia Fertilizer Co., Valdosta, and NFA chairman. 5. E. C. Westbrook, Extension Agronomist, University of Georgia. 6. Cooper Morcock, Barrett Division, secretary-treasurer. 7. J. M. Shepherd, V-C Chemical, acting secretary. 8-9-10. E. D. Alexander, Extension Agronomist, University of Georgia presents Dr. Glenn Burton, Chairman, University of Georgia Agronomists, who presents the speaker, Dr. R. E. Wagner, assistant to and pinch-hitting for Dr. W. M. Myers, USDA. 11. Herbert B. Davis, Spencer Chemical, Columbia, president of the South Carolina Plant Food Educational Society. 12. The official family of GPFES: Row 1: J. E. Nunnally, H. M. Arnold, J. B. Williams, Malcolm A. Rowe. Row 2: E. L. Anderson, W. E. Morgan, W. D. Barton, Treutlen Waller. Row 3: M. H. Barnett, W. L. Baughcum, W. A. Higginbotham, Jr., Ray King. Row 4: Cooper Morcock and A. J. Singletary.

It's a little hard to write this story, because it happened after the magazine was made up for February, and there's so much belongs in it, which cannot be written. But from the viewpoint of Commercial Fertilizer Magazine, this was one of the vital meetings of the year, or any year . . . another step forward in the progress of the fertilizer industry. Georgia is not the first state with such a Society. It will not be the last. Indeed, we believe it is only one of at least forty that are needed. And perhaps there should be 48.

The pictures show who spoke. The essence of what they said is that the whole field of agronomy and the fertilizer industry can move forward as a unit in states where such Societies are organized and functioning. For here were the men of the College, with all its ramifications down to the grass roots. Here were fertilizer manufacturers, their salesmen and their dealers. Here were the suppliers of the fertilizer industry all taking an active part in the development work, in stimulating membership, in actual offices in the society. And, as a token of USDA's interest—one of their top men as a luncheon and dinner speaker.

We were impressed that here is a movement that should spread across the nation, wherever the land needs plant food or will need it soon, doing a job wherever farmers need to be educated on the profit they can make by putting in a dollar's worth of fertilizer and taking out several dollars of crop or livestock.

EDUCATION REACHING TO THE GRASS ROOTS . . .

OUR BIG NEED!

An All Out Effort to Meet Demand for Nitrogen

Phillips is producing nitrogen fertilizer materials at full capacity. But even our tremendous rate of production isn't always sufficient to meet today's demand. We'll do our best for you. Keep us in mind if you need nitrogen in any form.

AMMONIUM SULFATE — Phillips *66* Ammonium Sulfate is a free-flowing 21% nitrogen material! Mixes easily! Uniform crystals resist caking! Ideal for high-analysis mixed goods! A fine direct application material!

AMMONIUM NITRATE — Phillips *66* Prilled Ammonium Nitrate contains 33% nitrogen. The small, coated prills or pellets resist caking . . . handle easily. Phillips *66* Prilled Ammonium Nitrate can be depended on for uniform, free-flowing properties and top-notch crop response.

NITROGEN SOLUTIONS — More N per dollar! Phillips *66* Nitrogen Solutions are well suited to the preparation of high-analysis fertilizers and the ammoniation of superphosphate. These three nitrogen solutions keep handling costs low . . . promote rapid, thorough curing!

ANHYDROUS AMMONIA — Tank car shipments of Anhydrous Ammonia (82% nitrogen) go out to Phillips contract customers from Phillips production facilities in the Texas Panhandle. Write our nearest district office for full information.

Phillips 66

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A Subsidiary of Phillips Petroleum Company

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Safety Pays Off in Cash

By W. N. Watmough, Jr.
Vice Pres. The Davison Chemical Corp., Baltimore, Md.
At the National Safety Congress

In order to do a better job of safety in the future we need to take a little jaunt into history, dig into the past. What was the business like 33 years ago when this young hopeful started out in the plant at 17,stenciling brand names and analysis on 200 pound burlay bags by hand? The bag room was adjacent to the rock grinding department. The dust in the air so thick you literally could not see across the room. Ten hours per day, 6 days per week and in the heart of the shipping season much longer hours.

You can imagine what the conditions were out in the plant as to dust and fumes. Superphosphate was cut out of hot dens by pick and shovel an hour after the phosphate rock had been treated with sulphuric acid! Nitrogen materials were largely of organic origin, dusty, bad odors, in fact, the mention of the word fertilizer caused noses to go up in the air with a derisive sniff.

Movement and processing of materials was by pick and shovels and the hand truck employing unskilled labor. Sixty per cent of the tonnage was moved in an eight hour period in the south and during a 16 week period in the north; an industry as highly seasonal as you could imagine. Over 80 per cent of the personnel laid off during the slack season.

Tonnage consumed by the farmer amounted to eight million tons at that time. It dropped to five and one half million in 1933, the worst depression year. Seasonal operations, poor working conditions, unskilled labor, high turnover, all contributed to what seemed an almost insurmountable problem to obtain funds from management to implement safety.

Let's take a look at where we stand today. Our industry is largely a chemical one now, synthetic nitrogen from the air, sulphuric acid by catalytic conversion of sulfur dioxide to sulfur trioxide, superphosphate by mechanical means, mechanically excavated and stored. Gases and fumes are recovered as a by-product to produce silico-fluorides for diversified industry.

We now produce 18 million tons compared to five and one half in 1933. And since fertilizers are much more concentrated, that 18 million is equivalent to 21 million tons when compared with the plant food content of 1933. Since most materials must be handled three times, received, manufactured to storage and shipped to the consumer, we move 63 million tons.

This major materials handling problem has been largely solved by the use of overhead bridge cranes moving four to five tons at one bite of the clam shell bucket, and in other type plants by every kind of modern mobile and conveying equipment you could possibly imagine. Dust conditions, while tremendously improved, still leave a great deal to be desired. Turnover is still high.

By manufacturing products of greatly improved storability we are able to move finished goods to the dealer and to the consumer well ahead of planting time, cutting down somewhat the extreme seasonal ing skilled and technical personnel, effected economies that have improved the earnings picture of the industry.

A large part of this saving has been passed on to the farmer. The price he pays for a far superior fertilizer based on recent index figures published by the National Fertilizer Association stands at 152 as compared with 272 for the index covering all of the commodities he buys.

Have we made the same progress in safety? Probably so, if we had the statistics to prove it. But only because our record was so disgraceful. We have not gone forward at the rate of other heavy industry, for example, chemicals or steel. Our company, as I'm sure is true with many other individual organizations, has made progress at a rate we didn't believe to be possible a few years ago.

The chart shows the past four and one half years record of the fertilizer division of our company, entirely separated from the record of the corporation as a whole. As most of you know, the injury index figure is the product of frequency multiplied by severity. Starting in 1947, we stood at just slightly better than the average of those fertilizer plants covered by the rather sparse statistics available.

Our medium sized fertilizer plant at Savannah, Georgia, passed the four year mark without a single lost time accident in September of this year. Naturally we are proud of this

	Frequency	Severity	Injury Index
1947	39.76	0.56	22.27
1948	19.76	5.47	108.09
1949	10.54	10.01	105.51
1950	5.49	0.13	.71
1951	10.14	0.29	2.94

(as of 6/30)

accomplishment. I wish I could say to you that we had discovered some startling, new, unheard of method or system to guide the industry and our own company in the future. But we haven't. There is no magic formula; our own record shows it. No, it's just the same old common sense formula:

1. A sound safety program. The man charged with this responsibility by the industrial relations section is a key member.

2. 100 per cent implementation by line authority is due to the full backing and in fact the insistence of top management.

3. 100 per cent interest and cooperation of every employee in the company is a selling job of line management, the union and the industrial relations staff.

In many companies the job of getting the wholehearted backing and enthusiasm of top management is a tough one, but the finest safety set up isn't worth a "tinker's dam" without it.

So I say to you safety men, get after your management. Keep hammering for the elimination of hazards in your plants. Organize your plant safety committee with rotating members from line authority and the rank and file. And if you do, there is no reason that a fertilizer plant can't be as safe a place to work as any other in a similar type industry.

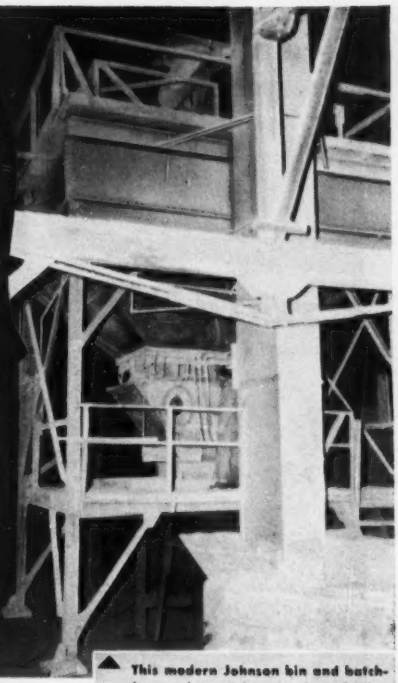
Sure, you have to invest money for safety, a lot of it. But the return on that investment in the form of injuries eliminated, lower turnover, higher grade personnel needed for a modern industry, will repay us ten times over. Frequently those returns are not all indirect. We recently received from the insurance companies $75,000, retrospective return premium on a premium which had already reflected our good experience.

So there is proof that safety can pay off in cash. A safe plant, a plant with good housekeeping, is an efficient one. It puts out quality products. It makes for low costs. Those are benefits worth going after.

JOHNSON *fertilizer* PLANT

• elevates
• pulverizes
• screens
• batches AND
• blends

IN ONE CYCLE OF OPERATION



This modern Johnson bin and batching equipment increased production 25% for a large midwestern fertilizer manufacturer . . . and, at the same time, greatly reducing manpower requirements in the plant.

Photo below, of one of Latin America's most modern fertilizer manufacturing plants, shows hopper, pivoted distributor and 8-section bin of a C. S. Johnson blending plant.

BY eliminating slow, costly manual operations, Johnson fertilizer blending plants profitably increase production output . . . and earn important savings in manpower. For example, on one typical Johnson installation, material travels via bucket elevator to clod breaker, where it is pulverized, then carried on belt conveyor to separating screen.

Collecting hopper under screen feeds the pulverized material to a pivoted distributor which charges a sectional 5-compartment bin. Multiple-material batcher accurately weighs 5 (or more) fine-grained materials and discharges batch into mixing unit for final blending operation.

Whether you are interested in complete plant installations, manual or fully-automatic, or need auxiliary equipment to modernize your present facilities, it will pay you to see your C. S. Johnson Co. distributor . . . or send coupon today for more complete information.

J181

Mail to: C. S. JOHNSON CO. CHAMPAIGN, ILL. (Koehring Subsidiary)

☐ Send us more data on Johnson fertilizer blending plants. ☐ Have Johnson distributor call.

NAME ..... TITLE .....

COMPANY ..... DIV. .....

STREET .....

CITY ..... STATE .....

Also interested in: ☐ bulk phosphate storage plants ☐ aeration systems ☐ screw conveyors ☐ bucket elevators ☐ bins ☐ hoppers ☐ batchers ☐ clamshell buckets

SOLD IN ADVANCE

FERTILIZER in COTTON PRINT BAGS!

to save you money by the TON

The cost of twenty bags, no matter what they are made of, has to be included in the price of every ton of fertilizer you buy. By packing in re-usable Cotton Bags — dress prints, quality sheeting, and serviceable toweling — your fertilizer manufacturer enables you to recover this bag cost.

Why pay for twenty bags that are a dead expense when, for slightly more, you can get more than twenty yards of cotton fabric for home sewing — worth much more to you than the original cost of the bags.

Cotton Bags, by paying their own way as containers, save you money on every ton of fertilizer. TALK TO YOUR FERTILIZER DEALER. Let him know that you want fertilizer in Cotton Bags to save you money by the ton.

FREE . . . 1952 **PATTERN SERVICE for sewing with Cotton Bags.** This valuable booklet will be sent to you with the compliments of your manufacturer who packs his product in Cotton Bags. Just mail the coupon with your name and address, and **give the brand name** of the fertilizer you buy

NATIONAL COTTON COUNCIL
P. O. Box 76
Memphis 1, Tennessee

Send me 1952 **Pattern Service for Sewing with Cotton Bags.**

Name .....

Address .....

Brand name of fertilizer I prefer .....

TO 1,174,000 SOUTHERN FARMERS

½ PAGE DECEMBER **Progressive Farmer**

Fertilizer packed in Cotton Print Bags is sure to have a sales advantage this season. The opportunity to get a wealth of good fabrics for home sewing (21½ yards with every ton) is a premium farm women will not pass by.

This coupon will sell for you! Your customer writes us for the 24-page Cotton Bag sewing booklet, mentioning your brand. We send the booklet, you get the credit. Write us today for other ways to use the booklet in building sales.

THIS COUPON WILL SELL FOR YOU

NATIONAL COTTON COUNCIL
MEMPHIS, TENNESSEE

home port–

H. J. BAKER & BRO.

With supply lines around the world, we can furnish manufacturers of fertilizer and agricultural chemicals with essential raw materials. When you have a problem, write, wire or phone us.

H. J. BAKER & BRO.

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★ ONE MAN BATCH WEIGH SYSTEMS
★ PLANT MODERNIZATION PROGRAMS
★ CONTINUOUS AMMONIATION UNITS
★ MIXING AND SHIPPING EQUIPMENT

Aerating Equipment
Automatic Control Equipment
Basing Units
Belt Conveyors
Bucket Elevators
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Continuous Acidulating Processes
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Conveyors
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Disintegrators
Dry-Mixing Units
Dust-Arresting Equipment
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Materials Handling Equipment
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Pneumatically-Operated Gravity Batch Mixers
Pneumatically-Controlled Valves
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Scales
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Shuttle Belt Conveying Systems
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SACKETT ENGINEERS

THE A. J. SACKETT & SONS CO.
1727 S. HIGHLAND AVENUE
BALTIMORE 24, MARYLAND

FERTILIZER TAX TAG SALES AND REPORTED SHIPMENTS1/
(In Equivalent Short Tons)
Compiled by The National Fertilizer Association

STATE	November 1951	November 1950	January-October 1950	January-October 1950	July-October 1951-52	July-October 1950-51
N. Carolina	1/ -	1/	1,632,420	1,621,707	185,205	196,913
S. Carolina	64,890	83,355	816,543	835,615	137,232	130,000
Georgia	59,307	88,684	1,137,095	1,084,826	118,784	128,521
Florida	166,505	148,351	941,521	828,222	286,574	258,074
Alabama	48,068	56,085	990,872	936,199	127,547	111,904
Tennessee	36,314	37,513	554,591	438,427	163,448	65,689
Arkansas	13,383	12,622	388,394	331,240	37,258	41,110
Louisiana	11,739	17,813	282,721	247,669	47,918	43,188
Texas	42,799	43,458	489,558	506,304	143,521	174,774
Oklahoma	1/	1/	140,342	132,797	51,774	44,485
TOTAL SOUTH	443,005	487,881	7,374,057	6,963,006	1,299,261	1,194,658
Indiana	179,325	97,590	686,805	715,338	235,235	249,849
Kentucky	23,641	31,240	459,374	499,755	109,039	100,348
Missouri	33,621	7,846	645,651	424,189	198,650	164,181
TOTAL MIDWEST	236,587	136,676	1,791,830	1,639,282	542,924	514,378
GRAND TOTAL	679,592	624,557	9,165,887	8,602,288	1,842,185	1,709,036

1/ Oklahoma and North Carolina report tax tag sales 30 days after the end of the current month. Oklahoma and North Carolina tag sales for October, 1951 represent 13,951 and 91,263 tons respectively, compared to 10,846 and 91,737 tons during October, 1950. Virginia reports quarterly.

MARKETS

Tag Sales Increase

October production of superphosphate, 18% A.P.A. basis, was 906,000 tons, 34,000 tons less than the 940,000 tons made in the same month last year, says The National Fertilizer Association. Since August 1, the critical shortage of sulfuric acid available for the manufacture of all superphosphates has forced production 100,000 tons below August 1-October 31, 1950 output.

Concentrated superphosphate manufacturers, hard hit by the lack of sulfur, produced 11 per cent less triple super in October of this year compared to October 1950.

Super Slump Continues

Fertilizer tax tag sales and reported shipments amounted to 679,592 equivalent short tons in November, 1951, for the 11 reporting States, according to The National Fertilizer Association. This is 8.8 percent more than the 624,557 tons sold in the same month last year.

January-October tag sales amounted to 9.2 million tons, 600,000 tons greater than during the first 10 months of the preceding year.

Based on tag sales and reports of shipments, 1951 fertilizer consumption for the Nation as a whole will be about 6 percent greater than 1950 consumption.

ORGANICS: Fair activity was noted during the first part of January for prompt and early spring shipment of Domestic Nitrogenous. Domestic Nitrogenous Tankage continues at prices ranging from $4.25 to $4.90 per unit of Ammonia, bulk, f.o.b. production point. Imported Nitrogenous is offered in very limited quantity at $6.15 to $6.25 per unit of Ammonia, in bags, CIF Atlantic port.

CASTOR POMACE: No spot supplies are available from domestic sources and movement is against contracts. Domestic price is nominally $37.25 per ton in burlap bags or $2.00 less in paper bags, f.o.b. Northeastern production points, for material guaranteed minimum 6.75% Ammonia. Imported Castor Pomace ranges in price from $44.50 to $47.50 exvessel Atlantic ports.

(Continued on page 52)

SACKETT FERTILIZER PROCESSING SYSTEMS PAY OFF

Control Panel

These fast fertilizer processing systems have reduced production costs in some plants as much as 65% . . . An estimated cost savings included with a Sackett survey of your production operations may even exceed this figure.

SACKETT ONE MAN BATCH-WEIGH SYSTEM

1. Eliminates waste of manpower.

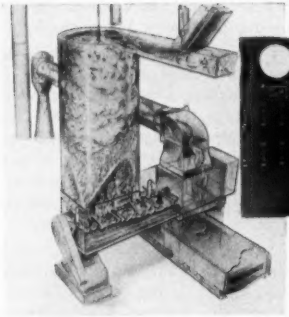
2. Fast-acting weigh valves and printed weigh record provides more rapid and accurate weighing.

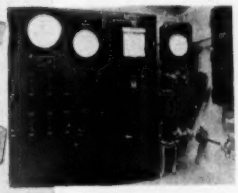
3. Circular design of storage hopper accelerates flow of ingredients through weigh valves . . . no corners or valley angles to retard flow of material.

4. Its compact design permits installation in existing buildings with minimum alterations.

5. The installation of this system does not, in any way, disturb existing mixing facilities.

Built in four sizes, 25 tons to 100 tons per hour.





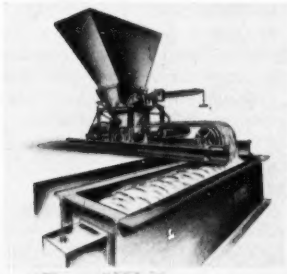
Central control panel shown above is nerve center of Super-Flo Process. Plant is operated from this point by one man.

SACKETT *Super-Flo*... A CONTINUOUS SUPERPHOSPHATE MANUFACTURING PROCESS

This new Sackett-conceived and developed process produces a superphosphate of premium quality in either powdered or granular form. Its complete mechanization and centralized panel control brings to the industry entirely new conceptions of high production speeds, low manufacturing costs and quality product control.

These Sackett patented processes are built in three sizes, 25 tons to 75 tons per hour.

Exclusive suspended acidulation produces highly converted superphosphate of excellent quality.



SACKETT CONTINUOUS AMMONIATING SYSTEM

The patented Sackett Continuous Ammoniation System is now being offered in four sizes with capacities ranging from 25 tons per hour to 100 tons per hour. This highly efficient method of ammoniating superphosphates and mixed goods with solutions offers many important advantages and is easily installed in connection with existing basing equipment. Higher ammoniation rates are made possible by its accurate proportioning of solids and solutions and lower reactive temperatures due to its exclusive aerating action which takes place during ammoniation. This system is also built in pressurized design for anhydrous ammonia or solutions having high vapor pressures.

SACKETT
BALTIMORE

America's Foremost Designers and Builders

SUPERPHOSPHATE PLANTS · FERTILIZER MIXING PLANTS · RELATED PRODUCTION EQUIPMENT

THE A. J. SACKETT & SONS CO., 1727 S. HIGHLAND AVENUE, BALTIMORE 24, MD.

Architects and Manufacturing Engineers to the Fertilizer Industry since 1897

D-K TANK MEASURES N SOLUTIONS BY WEIGHT

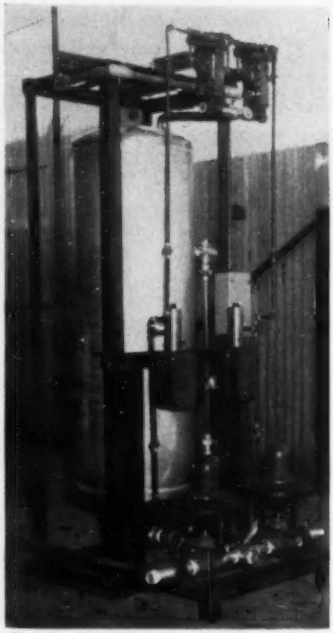
Davidson-Kennedy Co., Atlanta, Georgia, fertilizer equipment manufacturers and makers of automatic tanks for anhydrous ammonia and for nitrogen solutions, are offering the fertilizer industry a new step in fertilizer batch mixing, in the form of tanks that measure by weight rather than by volume. These new automatic tanks were developed in cooperation with several nitrogen solutions manufacturers and also with the help of several fertilizer manufacturers who offered facilities of their plants for the work in testing, etc.

The point made by Davidson-Kennedy is that temperature changes the density of the solution, which affects the accuracy of measurement by volume. Temperature does not affect the weight of the solution. Hence, they point out, the nitrogen content of the analysis can vary considerably as temperature change when the solution is measured by volume. This cannot happen when it is measured by weight.

The manufacturer has reasoned from the premise to a tank which is mounted on a scale beam. It is identical in form and area occupied to tanks now generally in use, and can be substituted for them without other changes in placing of equipment or plant construction.

The D-K Automatic Solution Tank is in effect the same as the pan of any beam scale. The counterpoise is so designed that a 10 to 1 ratio is achieved . . . a ten pound weight allows the tank to receive 100 pounds of solution, cutting off the flow accurately when the predetermined weight is in the tank, through a micro limit switch.

The D-K tanks go through the cycle of charge and discharge without attention, but under push-button control by the operator. A push-button opens the valve to the mixer line, and at the same time, starts the air pressure into the top of the tank to force the solution out of the tank.



The Davidson-Kennedy Automatic Nitrogen Solution Tank shown here carries the latest improvements. The first installation of the Davidson-Kennedy tank was at Chavalla Coop., Inc., Phenix City, Ala. (Feb. 1950) which has proved effective and efficient in operation. The Davidson-Kennedy tank is manufactured by Davidson-Kennedy Co., of Atlanta, Ga. (Patent applied for).

The time of such discharge, and the pressure, can be adjusted but continue, once established, until the tank is completely purged. Then the two valves are cut off automatically, and the intake valve from the storage tank is automatically opened, as is the vent at the top of the tank.

When the predetermined weight of solution is in the tank, the weight trips the lever-arm, actuating a switch that stops the filling action, and the equipment then awaits the operator's touch on the button.

All of this action is indicated by pilot lights in front of the operator. A red light is on while the cycle continues. A green light indicates the tank is full. The start button is constructed to prevent accidental discharge, and a quick-action stop button is handy in case of mishap, such as an empty mixer. An electrical counting device, which may be located as desired, automatically supplies an accurate batching record.

Davidson-Kennedy Co. were established in 1888, and produce a complete line of fertilizer machinery. Patent on the Davidson-Kennedy Solution Tank has been applied for.

BOOKS

PHOSPHATES IN AGRICULTURE, by Vincent Sauchelli, revised edition of the work originally published in 1942. Published by The Davison Chemical Corporation, Baltimore, Maryland. 176 pages $2.50.

This manual on phosphates is a very successful effort to put between covers a full array of pertinent information on phosphates, their origin, their processing and their uses, in a way that will be of practical value to fertilizer salesmen, county agents, agricultural teachers, farmers and fertilizer dealers.

Outstanding is the chapter on the use of the radiophosphorus tracer technique, in the development of which the author has played so important a part.

Developed originally as a manual for the use of Davison personnel, the outside demand was such that it was decided to make it available to the entire field of agriculture.

Wheel Measures Farm Areas

A measuring wheel which is exactly four feet in circumference, and which has many uses in land measurement, is offered by Rolatape, Inc., Santa Monica, California. It weighs only 5 pounds and registers distances up to 100,000 feet, then repeats. Counter is in plain view at all times. The handle folds so whole gadget can be stored in auto trunk. Stands by itself while operator logs data.

Sulphur

Thousands of tons mined daily, but where does it all go?

LOOK AROUND YOU and let your glance fall on any object. The chances are 1000 to 1 that sulphur played an important role in its manufacture, either as a component part of the finished product or as a processing element.

Take, for example, the very magazine you are reading. If it's average size it weighs about 1 pound. Made largely of sulphite pulp it required about 0.1 pounds of sulphur in its manufacture.

Multiply this 0.1 pounds of sulphur by the thousands of magazines turned out every day and you'll get some idea of the tremendous tonnage of sulphur required for this *single* division of industry . . . the sulphite pulp manufacture.

Sulphur has long been called One of the Four Pillars of Industry. Today's need emphasizes this fact more than ever. Sulphur producers are making every effort to get maximum production from existing mines and to develop new sources of sulphur as quickly as possible.

Texas Gulf Sulphur Co.

75 East 45th Street, New York 17, N. Y.

Mines: Newgulf and Moss Bluff, Texas

add Re-use Value with FULTON COTTON BAGS!

With every ton of fertilizer give your customer over 20 yards of quality sheeting or osnaburg which can profitably be re-used to make scores of household items. In addition to this valuable Cotton cloth premium to your customer, Fulton Cotton Bags stack, store, and handle easier with less waste from breakage. Your nearest Fulton factory representative will be glad to give you the FULL story of Fulton Quality Cotton Bags — for your fertilizer.

Fulton BAG & COTTON MILLS

Atlanta • St. Louis • Dallas • Denver • Kansas City, Kans. • New Orleans • Los Angeles • Minneapolis • New York City

CORN SHOWING MAGNESIUM DEFICIENCY

When corn is starved for magnesium, yellowish-green, light yellow or even white streaks develop between the parallel green veins in the leaves.

Fourth in a series of six advertisements showing magnesium deficiency symptoms in tobacco, cotton, grapefruit, corn, potatoes and oats.

You can supply magnesium in the most effective way in mixed fertilizers with..

Sul-Po-Mag®

Water-Soluble
Double Sulfate of Potash-Magnesia

Farmers in the territory you serve who are not getting the quality and yields of crops they want because of magnesium deficiencies in their soils need your help. These farmers who need magnesium can get it in the most practical and economical way in the form of *soluble magnesium* in mixed fertilizers.

Leading fertilizer manufacturers in most major farm areas are using *Sul-Po-Mag* in grades designed for crops grown on magnesium-deficient soils.

Sul-Po-Mag, mined and refined exclusively by *International*, is a properly balanced combination of potash and magnesium, both in soluble form. It is available in the tonnage you need for mixed fertilizers or bagged for direct application to the soil.

SUL-PO-MAG (Water-Soluble Double Sulfate of Potash-Magnesia)
MURIATE OF POTASH SULFATE OF POTASH

THIS IS WHY GROWING PLANTS MUST HAVE MAGNESIUM

- It is required in the life process which gives plants their green color and keeps them growing.
- Promotes earlier maturity on soils low in magnesium.
- Enables crops to make better use of other plant foods.
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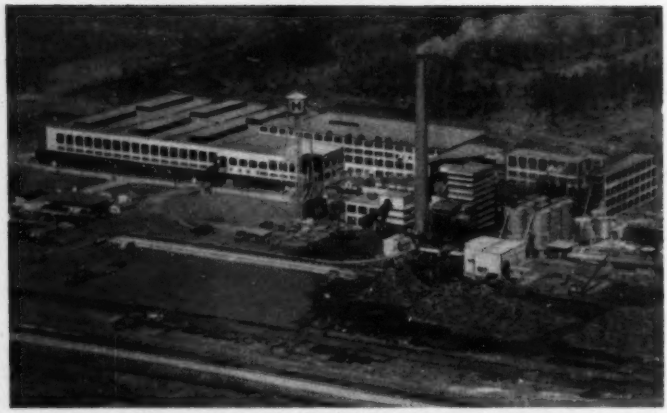


Hudson Pulp and Paper has recently doubled the capacity of its big mill at Palatka, Florida, acquired new timberlands, expanded pulping and papermaking and converting facilities. Push button operation speeds, and electronic controls protect quality at every step of multiwall sack making.

FLORIDA

Naco Fertilizer Company, Fort Pierce, seems beset with trouble. Just last month we reported the destruction by fire of their brand new "push button" fertilizer plant which had only just been put into operation. This month we must report that their insecticide plant, just across the highway, was rocked by the explosion of a mixing machine. Fortunately a blower had just finished clearing the air of sulphur dust, otherwise the whole plant might have gone up. As it was, nobody was hurt though the explosion force was sufficient to break a 1½ inch rail on the catwalk.

* * *

Virginia-Carolina's new uranium recovery unit will be near Nichols, according to President **Joseph A. Howell.** It will include an advanced type contact sulphuric plant, a wet process phosphoric acid plant with uranium extraction provided, and a complete triple superphosphate unit, including granulation equipment. Mr. Howell says it will be one of the most modern and efficient production units of its type in the U.S.

V-C owns some 37,000 acres of phosphate field land and produces about 1,250,00 tons of rock annually from its Florida mines, which will supply the new plant. Mr. Howell says conservative estimates are that reserves of high grade rock in the ground are enough to maintain this rate for a quarter century.

* * *

Coronet Phosphate Co., Plant City, suffered a $50,000 loss when a building being converted into a research laboratory was destroyed by fire, apparently the product of chemical reactions. The loss will not interfere with plant production.

INDIANA

Armour Fertilizer Works, Jeffersonville, wound up the year with a fire which destroyed much of the mixing tower. The tower was of wood, 48 feet square and 60 feet above the ground, and made a spectacular blaze, though Superintendent **W. C. Brodfuehrer** could not immediately estimate the damage to the equipment.

ILLINOIS

Lis Elevator Co., Newton, has completed a 400 ton phosphate bin which can be loaded directly from railroad cars via bucket type conveyors, and which will discharge directly into trucks at the base of the bin.

KANSAS

Farm Belt Fertilizer and Chemical Company, Kansas City, were robbed of a 550 pound safe, containing $400, on the eve of New Year, according to President **Doyle Patterson.**

* * *

Snyder Chemical Co., Inc., Topeka, will begin this month the construction of a new plant in Hutchinson, where President **Jack B. Snyder** has bought a 30-acre tract. The plant is to be a prefabricated steel structure, 100 by 80 feet, and Mr. Snyder says he expects it to be completed and in production by May.

The plant will produce a pellet-conditioned, semi-granular fertilizer of high analysis. Top personnel will be transferred from Topeka. Snyder Chemical was founded in 1947.

LOUISIANA

Commercial Solvents has awarded construction contract to **Ford, Bacon and Davis Construction Corp.,** Monroe, for the building of the $20.-000,000 ammonia and methanol units which will double the present production at Sterlington, according to **Maynard C. Wheeler,** v-p in charge of production and engineering.

MISSOURI

Monsanto Chemical, St. Louis, has announced Krilium, a new synthetic organic chemical which is many times more effective in improving soil structure than compost, manures or peat moss, they report. It is expected to be applied in home gardens, truck farms and greenhouses, according to **Dr. C. A. Hochwalt,** Monsanto's research and development v-p. Though it costs $120 per acre to apply, it is highly resistant to bacterial decomposition.

Krilium is also effective in the control of rain erosion problems created by major earth-moving projects, and in farm lands as a spot-control medium. Tests now being conducted by universities, federal

Around the Map

and state agencies at 80 points are expected to produce detailed data in both fields.

President **Charles Allen Thomas,** who made the announcement, stresses the point that Krilium is not a plant food. It's soil structure effect is that one pound equals 200 pounds of peat moss, 500 pounds of commercial compost. Krilium is priced at $2 per pound during its initial production stages.

* * *

Producers Exchange has awarded a contract for construction of $6,000 phosphate storage bins at Truesdale, according to President **William Schowe.** The bins will have capacity for 2½ carloads of phosphate rock, with automatic loading in or out. It is to be ready for use by April 1.

NEW YORK

American Agricultural Chemical, New York, was awarded a certificate of management excellence for 1951 by the **American Insitute of Management.** The award is based on ten factors: economic function, corporate structure, health of earnings growth, fairness to stockholders, research and development, directorate analysis, fiscal policies, production efficiency, sales vigor, and executive evaluation. 7,500 out of 10,00 points must be chalked up before the award can be given.

OREGON

J. R. Simplot Enterprises completed a new warehouse at Klamath Falls December 28. An open house was held to which flew **Mr. Simplot, L. E. Haight** president of the firm; and **L. E. Haight,** assistant to Mr. Simplot, both of Boise; **J. L. Wursten,** Idaho Falls; **Ralph Nyblad,** Caldwell, and **Joe McCollum,** Twin Falls, district manager, and **E. W. Hansen,** Pocatello, manager of **Simplot Fertilizer Co.**

Manager at Klamath Falls will be **Ben McCollum,** brother of the Twin Falls manager.

TENNESSEE

Penn-Dixie Cement Co., Kingsport, has invited farmers to help themselves for plant food use cement dust which has been collected by a newly installed wet process. U of Tennessee tests indicate the dust is high in potash, and suited to the soils of that region. An Alabama cement concern is said to be marketing a similar by-product to South Carolina peach growers, and the Kingsport concern, one of a chain, is considering eventual marketing through commercial channels. Some 75 daily tons formerly settled on the nearby landscape around the Kingsport plant.

TEXAS

City of Houston went into the fertilizer business last year with an investment of $1,300,000 for a sewage plant, sold the entire production of 9133 tons, realizing $121,700, and expects to do even better in 1952. The product is trade-marked Hou-Actinite, and is shipped to such remote points as Oregon and Florida through H. J. Baker & Bro., who are sole distributors. The gross income just about equalled the production cost plus the interest on the bond debt incurred in construction of the plant. The city figures, however, that they have saved the cost of hauling, and eliminated source of unpleasant odors.

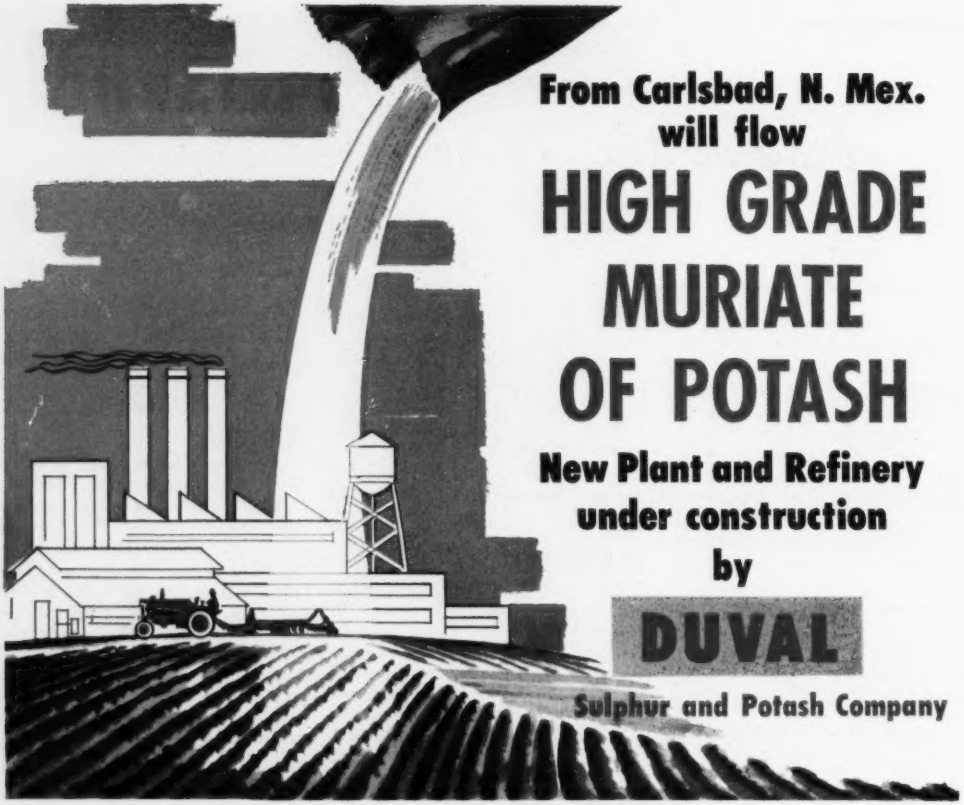
VIRGINIA

Bluegrass Lime Co., Maxwell, went back into business January 1, having rebuilt the plant destroyed by fire October 1949. The new plant is completely modernized. It was founded in 1914 by the late **Fields Graybeal,** is owned by **A. S. Graybeal** and is operated by his son, **Hopkins Graybeal.** Tragedy has followed this plant, the original Greybeal and his son being killed while investigating a shot that failed to go off in 1941. Two employees were kill in the 1949 fire.

CANADA

Consolidated Mining & Smelting, of Canada, Ltd., Montreal, has been awarded a certificate of management excellence for 1951 by the **American Institute of Management.** (See Amer. Agricultural Chemical item, NEW YORK)

Believing as we do that education must go down to the grass roots, Spencer Chemical are publishing a dealer magazine "Today's Fertilizer Dealer." The illustration shows the editor, M. H. Straight, conferring in the back room of a dealer's place of business, where he gathers his material first hand. Mr. Straight is advertising manager of Spencer Chemical.



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NEW SULPHURIC ACID INSTALLATION OF "SOCIETE BOZEL-MALETRA"

By FLAMENT *and* HOUDIN

For a little more than 20 years the sulphuric acid market has shown two very distinct tendencies which are at the same time the effect and cause of progress. The reactions of Sulfonation require concentrated acids and the development of artificial textiles has only been possible on the basis of relatively pure acids. Hence the two tendencies: the continued increase both in the consumption of oleum and in increasingly concentrated acids and the necessity of an increasing purity. Only the contact process allows of obtaining simultaneously oleum, high concentrates in monohydrate and the quality.

Speaking about Europe in general, the rare occurrence of sulphur and the price resulting therefrom have induced industrialists to use sulphur-bearing minerals (pyrites, blendes, etc.). In spite of this, the sulphur in these minerals is still very dear and constitutes, in fact, more than 80% of the cost price of the acid produced. Improvements were carried out at all stages of manufacture with a view to obtaining an optimum output based on the total sulphur used.

It is from this angle that we propose briefly to describe the recent installations of "Societe BOZEL-MALETRA" at their works at Petit-Quevilly and to indicate the results obtained.

In addition to the research carried out in regard to optimum output, an aim equally aspired to was elasticity of operation, which enables the manufacturers to satisfy the demand of customers varying between 35 and 120 tons per day of contact acid or oleum. That is why instead of one single catalyser unit of a nominal capacity of 100 tons per day, two similar units with a capacity of 50 tons per day have been installed. Generally speaking, the other various apparatus are smaller but more numerous than in the case of a normal installation for 100 tons per day. The initial installation costs are certainly much heavier but elasticity and smooth running have been improved.

This paper was presented at the Technical Meetings of the I.S.M.A. in Paris on September 25th and 27th, 1951.

1. PRODUCTION OF SULFUROUS GAS

This production is effected by five large furnaces, three of the Maguin type, some several years old, with a capacity of 18 tons of pyrites per day, two of the Induschimie type with a multiple feeder which allows of a variation in capacity ranging from 16 to 30 tons of pyrites a day in extreme cases, the normal range being 19 to 27 tons per day.

It is the above reason which has dictated the use of these furnaces rather than the horizontal rotary furnaces or flash roasters.

It appears to us useful to give some supplementary information with regard to feeding and the construction of these furnaces.

In view of the fact that with furnaces having a single upper feeding unit, the quantity of pyrites burned per square metre of hearth suitable for roasting, amounts to between 80 and 100 kgs, this quantity can rise to 150 or even 170 kgs with the "Induschimie" multiple feed furnace.

Pyrites are introduced into the

THE SULPHUR PICTURE

The Sulphur Committee of the International Materials Conference, by way of questionnaires to all non-iron-curtain countries, has come up with a figure of estimated 1952 sulphur demand of 7,596,300 long tons, with an estimated production of 6,255,600 tons. About half the production is supplied by pyrite, of which there is a virtually unlimited supply, and expansion of this source is held back only by the difficulty of getting more mining equipment.

So the Committee anticipates that the present serious shortage will persist into 1953. The DPA program calls for 8,400,000 long tons by 1955.

Where this is coming from is of course vital to our industry, because 75% of sulphur consumed goes into sulphuric, about 37% of which in 1950 went into fertilizer.

Commercial Fertilizer has been publishing month by month the announcements of new plants and new sources. For example, in mid-January, in one week, DPA issued certificates of necessity for sulfuric acid production like this: Humble Oil $588,000; Consolidated Chemical Industries $3,000,000; Anaconda Copper, $1,550,000; Pure Oil, $2,478,000 and $32,000. And in DPA's book, sulphur now stands as Number 7 in the priority rankings.

In addition to the above, Allied Chemical & Dye plans a nine million dollar acid unit at Elizabeth, New Jersey.

And you can add to the sources of sulphur itself the third effort in the past 15 years to put into commercially practical use the sulphur ore deposits of Utah, where 25% brimstone ore shows up 30 feet below the surface, and drillings already made indicate three million tons of it with more drillings still to be made.

In this field Chemical Corporation of America, reported to be backed by several chemical companies, will erect at Sulphurdale a pilot plant, which will be followed by a 1000-ton mill if all goes well.

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first three odd-numbered hearths (centri-petal hearths). The proportions introduced into each hearth can be regulated according to the total charge of the furnace, the quality of pyrites and the rate of combustion. It is possible, for example, to supply to hearth 1, 50%, hearth 3, 35% and hearth 5, 15%. It it a priori evident that the temperature is thus regulated and that, at the same time, the active combustion zone is spread over a greater number of hearths than in the same furnace fed to the extent of 100% in the upper hearth.

In addition to these advantages, there is a better equilibrium between the expansion and cooling of the mechanical parts.

These furnaces are very elastic and permit of the roasting of flotation pyrites (such as Cyprus and Boliden) the combustion rate of which is very considerable and which are dangerous to normal furnaces. In the case of a stoppage of one of them, it is, on the other hand, possible with a battery of 4 or 5 furnaces, to avoid a falling-off in output by a rapid increase in the actual charge of the furnaces remaining in operation.

With a pyrites such as the Kalavassos with 48% of sulphur the sulphur burning efficiency is 98% minimum.

As to construction, it has been known for more than 10 years, that the lining and the hearths built of refractory materials have been replaced by some industrialists by a concrete made of fused Lafarge cement in the construction of the furnaces of a small diameter (up to 4.50 metres). At the present time, the same material is being used for furnaces with a diameter of 6 and even 6.50 metres.

The manufacture of refractory concrete certainly requires much care but it is possible to replace the specialists in furnace setting by reliable and conscientious masons. By way of example, we would mention that the interior fittings of a Maguin furnace of 18 tons per day (6 metres in diameter) and comprising the walls and 10 ceilings have been built within 20 working days with 11 workmen, 4 of whom were masons. For the same furnace constructed with refractory bricks one would have to reckon with 65 working days with 7 workmen two of whom would be specialists in furnace setting.

The times for attaining the required temperature are also widely divergent. With concrete 8 days are sufficient to heat a mass of 168 tons saturated with water. With refractory bricks there weeks would be necessary so as to avoid rough treatment. Finally, the materials necessary only represent ⅔ of the price to be paid for fitting with shaped refractory material.

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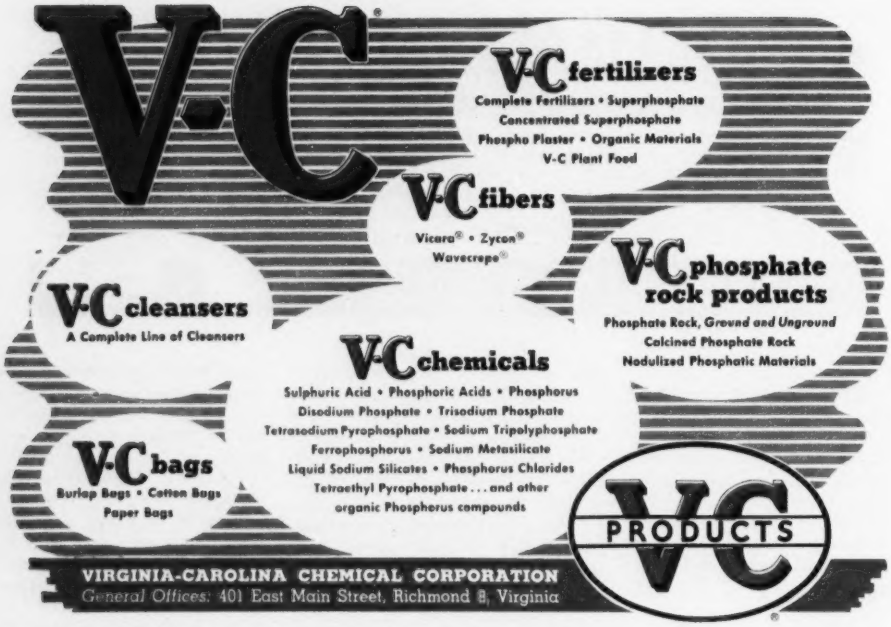

II. PURIFICATION OF SO_3 GAS

This purification is effected by

(1) an electric dust precipitator of the Cottrell type in two installations, one constructed by SPIG, the other by CECA. We should like to recall that the coolest points must have a temperature of more than 350° centigrade.

(2) an **empty tower** in which a very large quantity of acid is atomised and which has the function of cooling and de-arsenating the gases which leave the electric dust precipitator.

The circulation of acid absorbs As203 which has to be eliminated continuously at a well chosen point of the circuit. The necessity of cooling energetically large quantities of acid may, however, present difficulties.

A happy solution appears to have been found by "Societe Induschimie." After concluding semi-technical trials, construction is actually being carried out and we propose to describe only the principle thereof. Crystallisation of As203 has to take place during movement and the velocity of the circulation of the acid in the crystalliser must be such that the crystals remain free and do not stick. By creating a circuit branching from the main circuit and by submitting the acid of this small circuit to energetic agitation and cooling it is possible to avoid a thorough cooling of the total quantity of the circulating acid in order to maintain an As203 content which is not inconvenient.

This empty tower recuperates the SO_3 formed in the furnaces and allows production of an acid with 50% monohydrate suitable for the manufacture of fertilizers after concentration.

(3) **a cooling tower** the aim of which is to improve the purification of SO_2 and to decrease the temperature of the gases as much as possible and, in any case, below 30° centigrade.

(4) electrostatic precipitation of the mist in two units of the wet Cottrell type, one constructed by SPIG and the other by CECA.

The gas is then dried in a tower and the upper portion of which forms a screen so as to avoid the entrainment of acid mist in the stream of dry gas.

This drying permits gases with 7% SO_2 and containing less than 60 milligrammes of water per cubic metre to be obtained.

In order to limit the losses due to dissolution, in the drying acids, of SO_2 which would be liberated in the absorption tower, the circulation in the drying tower is independent from the circulation for absorption. The content is maintained by adding 98.5% acid and the minimum quantity of the weakened acid is recycled to the nearest absorption tower. This small quantity of acid which only depends upon the humidity of the gases, i.e. of their temperature, can be freed of gas at the outlet of the tower by an air jet. This supplementary air only slightly dilutes the gases traveling to the catalyser.

(Continued on page 54)

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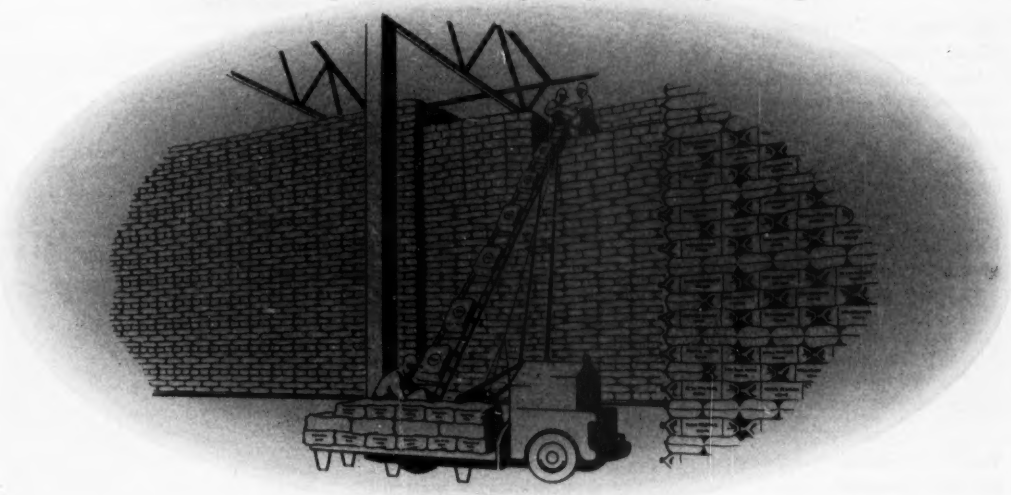

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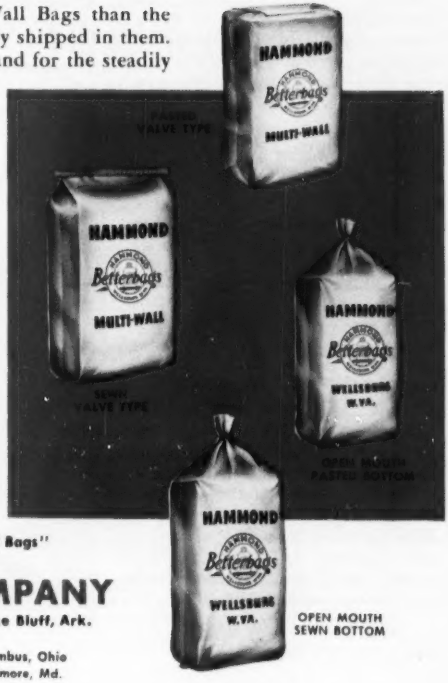

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ALLIED FARM CHEMICALS

500 Meet In California Weed Conference

The fourth annual California Weed Conference, meeting January 22-24 at San Luis Obispo attracted some 500, to hear 30 of the State's outstanding research and control specialists.

Fifth Southern Weed Conference

The fifth annual Southern Weed Conference is slated to be held at the Hotel Biltmore in Atlanta, Georgia, February 6-8. Emphasis will be on the use of herbicides in the growing of cotton.

Solvay To Build On Salt Deposit

Solvay Process Division, Allied Chemical & Dye, plans to build a mercury cell chlorine-caustic soda plant on a 400-acre property, which has been proven an extensive salt deposit, near Moundsville, West Virginia. The plant will cost $15,000,000 and will require 18 months to 2 years for completion.

Sharples-Pennsalt Merger Completed

Through an exchange of common stock, Sharples Chemicals has become a unit of Pennsylvania Salt Manufacturing Co., Pennsalt president George B. Beitzel has announced. It will be operated as a separate unit, with such coordination as will be of mutual benefit. The Sharples plant is adjacent to the Pennsalt Wyandotte plant.

Pennsalt has been chosen as one of the ten best managed corporations of three thousand studied by the American Institute of Management, and awarded the certificate of management excellence.

V. N. Wilson has been named superintendent of the Bryan, Texas, Pennsalt plant, relieving Howard L. Teer of this phase of his duties and enabling him to devote full attention to his function as district manager for farm chemicals.

Tobacco By-Products Plant Suffers Dust Explosion

An explosion, apparently caused by tobacco dust, brought on a five-alarm fire at the Richmond, Virginia, plant of The Tobacco By-Products & Chemical Corp. recently.

Naco Insecticide Plant Explosion

The insecticide plant of Naco Fertilizer at Fort Pierce, Florida, was rocked by the explosion of a mixing machine January 9, without injury to personnel. Sulphur dust had been removed from the building by a blower just prior to the explosion, otherwise the result could have been much more serious. Naco's newly completed "push button" fertilizer plant, just across the road, was destroyed by fire in November.

Clyde T. Marshall, who has been named general manager of Commercial Solvents' newly organized Agricultural Chemicals division.

To Spray In 11 S.E. States

Farrens Chemical, a subsidiary of Farrens Tree Surgeons of Jacksonville, Florida, has been established to do farm spraying in eleven Southeastern states.

Joseph S. Whittington, who has been appointed manager of agricultural chemical sales, Morgantown division, Mathieson Chemical.

G. R. Monkhouse, who has been made vice-president, Western division, by Shell Chemical with whom he has been for 30 years.

Walton Manager Of CSC Peoria Plant

M. Thomas Walton has been named manager of Commercial Solvents Corporation's Peoria, Illinois plant, it was announced by Maynard C. Wheeler, Vice President in Charge of Production and Engineering.

Mr. Walton succeeds George O. Lines who has been named General Manager of CSC's newly created Animal Nutrition Division, headquarters for which are located at the company's general offices in New York City.

Mr. Walton joined Commercial Solvents in 1933 as a bacteriologist assigned to the company's Terre Haute, Indiana, research center.

MARKETS

(Continued from page 34)

DRIED BLOOD: Unground Dried Blood at Chicago is offered at $8.25 to $8.50 per unit of Ammonia, bulk, f.o.b. Chicago area. The New York market continues quiet at around $8.50. No unusual activity is noted.

POTASH: Movement of domestic muriate of Potash has increased to about normal. From present indications it appears there will be no spot period, due to heavily sold production for the period May 1st to May 31st, 1952. A few pilot cars have been produced and shipped by one of the new Potash Companies.

GROUND COTTON BUR ASH: Supplies of this Potash, primarily in the form of Carbonate of Potash, continue available for prompt and spread shipment. The better productions consistently test around 40% K_2O and this material delivers in most areas approximately at same price as Sulphate of Potash.

PHOSPHATE ROCK: Supplies in general continue in comfortable position with movement steady to domestic consumers. It is indicated that Japan may re-enter the market in the near future for supplies.

SUPERPHOSPHATE: This market continues extremely tight, both for triple Superphosphate and Normal Superphosphate. Practically all producers are sold up through June and the movement against contracts is approaching peak volume.

SULPHATE OF AMMONIA: Production continues to be shipped as produced allowing no stocks to be accumulated. Prices remain firm and unchanged.

AMMONIUM NITRATE: Demand continues somewhat in excess of supply. The price for domestic material ranges from $61.00 to $64.00 per ton, f.o.b. shipping point. Canadian material continues at $69.50 per ton in bags.

NITRATE OF SODA: Market position is firm as demand expands in seasonal proportions. Stocks of Imported material appear to be adequate.

GENERAL: Superphosphate is expected to be short of over-all demand and is the prime problem of smaller fertilizer manufacturers. Nitrogen continues second on the list of materials somewhat short of

(Continued on page 52)

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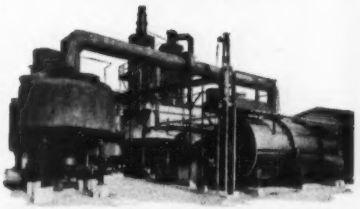

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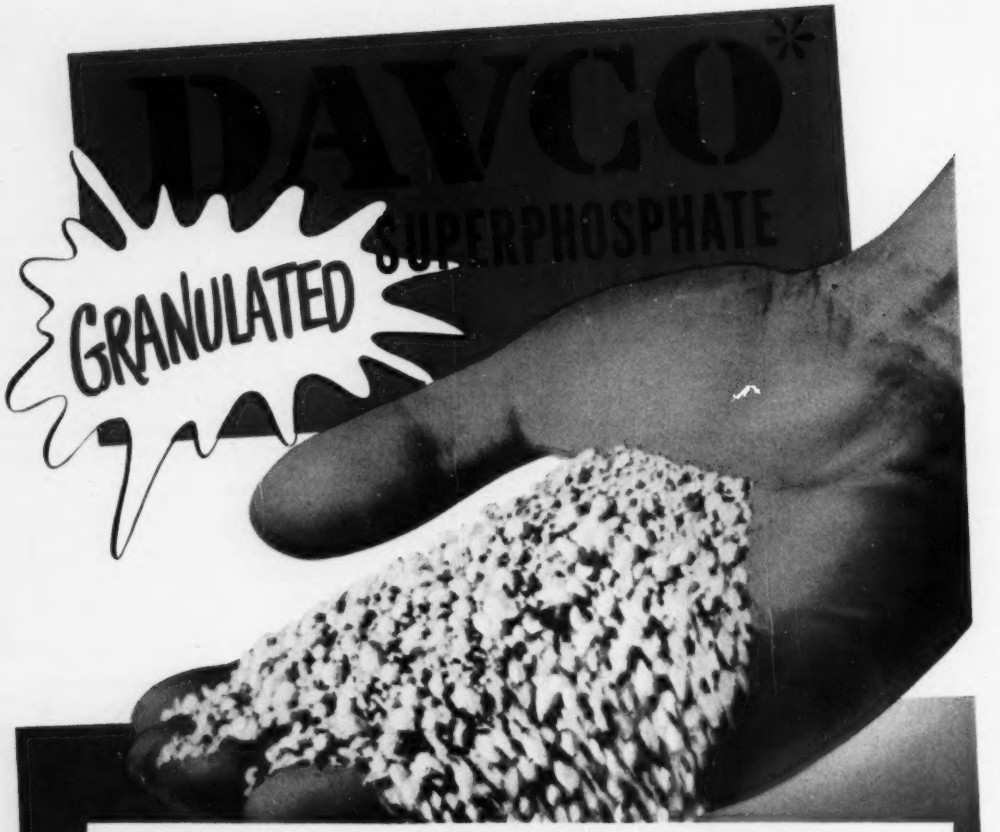

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DAVCO GRANULATED SUPERPHOSPHATE gives the added points which can make a sale and in turn will keep that customer sold. Order your superphosphate now, but be sure it is DAVCO GRANULATED SUPERPHOSPHATE WITH THE 3-WAY CONTROL.

*Reg. T. M.

Progress through Chemistry

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Mostly Personal

P. George Maercky, due to ill health, has retired as vice-president of **Texas Sulphur Company** and **Richard T. Fleming** is v-p and general counsel. **E. F. Vanderstucken, Jr.,** is secretary.

* * *

T. W. Allen, president of **Sand Mountain Fertilizer Co.,** Attalla, Alabama, is in the hospital for a major operation.

* * *

Dr. Ambrose G. Whitney, formerly with Armour & Co., has joined **Davison Chemical** as a development engineer in the research and development department.

* * *

Robert I. Troxell, for ten years attorney for **J. R. Simplot Company,** has been made executive vice-president and general manager, a new position created to give **Mr. Simplot** "more time for policy consideration and long-term planning."

Troy B. Stone, in addition to his duties as personnel director of **Fulton Bag and Cotton Mills** is now also head of the public relations division. He has been with them 32 years.

* * *

G. V. Arnold and **F. E. Rembert** have been made district sales managers for **National Gypsum,** at Atlanta and Jacksonville respectively. **William H. Pulley** remains in charge of the Southeastern division, and announced the promotions as filling a need for added management personnel in the area.

* * *

William J. Murray, Jr., board chairman of McKesson & Robbins, has been named to the board of **Interntional Paper Company,** to fill the vacancy created by the death of **Albert H. Wiggin. William B. Porterfield, Jr.** has been made assistant sales manager of **United States Potash,** and **Sam E. Hardwick** is now sales representative in the former Porterfield territory, according to word from **Dean R. Gidney,** sales manager.

* * *

James Wallace Dean, president of **Knoxville Fertilizer Company,** Knoxville, Tennessee, married his cousin, **Katie Dean,** January 8.

* * *

Allen S. Jackson has been named sales engineer in the Mississippi Valley territory by the fertilizer machinery manufacturing division of the Davidson-Kennedy Company of Atlanta, Georgia.

* * *

Otis G. West, for some twenty years in the New Orleans sales department of **Fulton Bag and Cotton Mills,** and with the company since 1917, has returned to New Orleans from the West Coast where he has been the last three years. His friends will be glad to know he has recovered from his long illness.

* * *

Ray C. Ellis, president of **Ellis Chemical Company,** New Albany, Indiana, was on the Coast, visiting his daughter, Virginia, and her husband, Stanley Botkin. While there he got on the Double or Nothing program. We happened to catch this show and what we want to know, Ray, is how you knew so exactly how many widows live in your home town? Ray spoke highly of the fertilizer industry while he was on the air.

Julian B. Mendelsohn, who has been made sales manager of the multiwall sack department of Hudson Pulp & Paper.

Gene Thomas, who has been appointed district representative for The Frank G. Hough Co., covering Washington, Oregon, Idaho, Montana and Wyoming.

Brig. Gen. David N. Hauseman (rtd) who has become a marketing executive of Davidson Chemical, resigning the presidency of Houdry Process Corp. to take the post.

Raymond P. Wiggers, The Frank G. Hough Co., has a house publication called "Industrial Handling," which does a good job to showing how Payloaders work for industry. We were tickled by a headline on an article asking folks to get out scrap, and showing how Payloaders would help load it . . . the caption: "Old metals never die—they just smelt away."

* * *

J. Walter Harding has been appointed Manager, Purchasing and Traffic, of **Federal Chemical Company,** Louisville. Mr. Harding was Traffic Manager and has been with Federal four years.

* * *

John D. Kramer, chemical engineer of Monroe, Louisiana, has joined the Dixie Research Division of **Commercial Solvents Corporation,** at the research laboratory of CSC's Sterlington, Louisiana, plant which is largely devoted to the production of anhydrous ammonia, methanol and the CSC anti-freezes.

* * *

W. L. Patrick, with **Chase Bag Co.** since the end of World War I, has retired and will be succeeded by **R. F. Rhoden,** with Chase since 1947.

ALLIED CHEMICALS

(Continued from page 49)

demand. Potash supplies are expected to be adequate in view of a new domestic producer and considerable importation.

Association Organized In Colorado

Colorado Agricultural Chemicals Association has been organized. This group consists of manufacturers, formulators and distributors of agricultural chemicals, was formed to advise, assist and cooperate with State and Federal research programs with regulatory bodies, and to promote means of improvement of agriculture in Colorado.

At the first meeting in December five Directors were elected: C. A. Dewey of Grand Junction, Colorado, B. T. Snipes, P. A. Ray, W. E. McCauley and F. P. Jasper all of Denver. The directors in turn elected Mr. Dewey President, Mr. Snipes Vice President, and Mr. Ray Secretary-Treasurer.

Chemical Corp. Doubles Insecticide Plant Capacity

Chemical Corporation of Colorado have taken over the former Greager Manufacturing Co. plant in Denver, and are transforming it into a modern plant for the production of insecticides.

Daly-Herring Leases North Carolina Plant

Daly-Herring Co., Kinston, North Carolina, formulators of insecticides and other specialties, has leased buildings for a new plant at Ahoskie, North Carolina.

Southern Ag. Chem. Is New S. C. Concern

Organized to compound insecticides and fungicides, Southern Agricultural Chemicals, Inc. has been organized at Kingstree, South Carolina with a capital stock of $50,000.

MARIETTA air cell silos CAN BE ERECTED THE WAY YOU WANT THEM!

If you need storage tanks in line, in clusters or combined with existing units . . . in sizes from 10' to 30' in diameter, and 30' to 100' in height, Marietta can quickly erect them.

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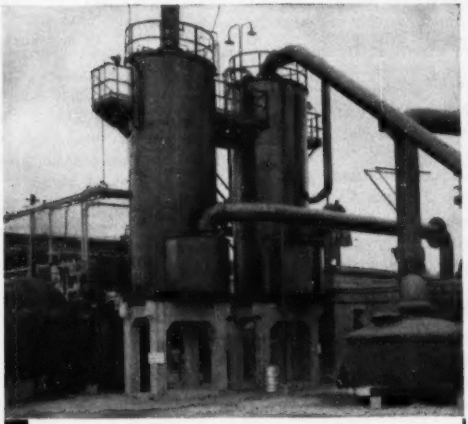

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Monsanto-designed sulfuric acid plants now are producing approximately 40 per cent of the free world's contact sulfuric acid. There are more than 300 of these efficient, economical plants, operating in 26 countries around the globe. Monsanto-designed plants, employing Monsanto Vanadium Catalyst, do not depend upon elemental sulfur alone, but work with all known raw materials. Monsanto designs, having many exclusive features, are based on more than 30 years' experience in sulfuric acid plant design, construction and operation. If you are considering a sulfuric acid plant for the future, you are invited to discuss your problems with Monsanto engineers. Their counsel costs you nothing . . . puts you under no obligation.
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Subsidiary of United Engineering and Foundry Company
General Office & Works: AURORA, INDIANA

SULPHUR

(Continued from page 46)

III. OXIDATION OF SO_2 GAS

The installation comprises two catalyser units of the INDUSCHIMIE type, having 2 stages and an intermediary exchanger.

These apparatus are carefully protected against loss of heat which gives them considerable heat capacity, hence an insensibility to exterior conditions and to stops of a short duration.

It is evident that the numerous possibilities of regulation make it possible to circulate relative proportions of hot and cold gases necessary to obtain a system of constant temperature.

It would have been simpler to construct an apparatus with a nominal capacity of 100 tons per day with three stages but we have already given the reason for our choice.

The Vanadium Catalyser, manufactured by Induschimie has been studied with particular care with a view to obtaining—a very pronounced mechanical resistance and almost total insensibility to thermal disturbances

—a great activity which enables the manufacturer to obtain an optimum output with a minimum volume of catalyser.

—a low charge, hence an economy in driving power.

The dimensions of the grains of the catalyst vary according to whether it is the first stage which works at a higher temperature and which contains the production mass (these give in fact 80 to 85% of the total conversion) or the second stage which represents the finishing mass or output and which, must ensure a final conversion of 98.5%.

In these two units of nominal 50 tons each, the quantities of masses are approximately 450 litres per ton produced per day. These apparatus are extremely elastic and easy to run. It is possible to obtain all the rates of operation from 37 tons to 65 tons a day.

Without the nominal charge, the conversion attains 98.5% and with 60 tons it does not go below 97.7% with gases having a SO_2 content between 6.5 and 7%.

IV ABSORPTION OF SO_3 PRODUCT

There two towers which absorb more than 99.5% of the SO_3 produced.

The first tower, or Oleum tower, received the major portion of the gases at a temperature in the neighborhood of 160° centigrade. It is sprayed with a considerable quantity of 20/25 oleum, the concentration of which is maintained by an addition of 98.5% acid.

The second, or 98% tower, receives the remainder of the SO_3 from the preceding tower together with a portion of the direct gases at 160° centigrade. It is sprayed with a considerable quantity of 98.5% acid, the concentration of which is maintained by the addition of an acid decreased to 97% coming from the drying tower or by the addition of water.

The circulating acids are energetically cooled in tubular coolers. A single absorption tower would suffice for the manufacture of 98% acid without oleum.

The use of immersed vertical pumps enormously simplifies the installations and avoids the trouble of installing stuffing-boxes. The acids obtained contain less than 1 milligramme of arsenic per kg and 30 to 35 milligrammes of iron.

The absorption is almost complete and no trace of SO_3 is noticeable in the chimney. This installation is very easy to run thanks to the apparatus for controlling the acid content, placed at the disposal of the staff.

V. CONTROL

The control is ensured by

(a) two electric SO_2 analysers of the Siemens type, well known and reliable.

(b) two multicurved MECI thermometric apparatus (Leeds and Northrup patents)

(c) two electronic Speedomax galvanometers of great precision with which any deviation of the indicator is immediately visible. They make is possible to read off 25 temperatures in less than one minute.

(d) titrimeters and potentiometers for absorption acid which give a continuous measurement of the content of 98% tower acid, between 96 and 99% (the figure of 98% is in the centre of the diagram), as well as the content of oleum, between 16 and 25, of the other tower.

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Charleston, S. C., Roebuck, S. C.

VI. RECAPITULATION OF OUTPUT

(1) **Furnaces**—Minimum output 98%

(2) **Purification of SO_2**—Minimum output 99.5%
(taking into account 4 to 5% reclaimed in the form of impure 50% acid and coming from the SO_3 of the furnaces)

(3) **Drying**—Minimum output 99.5%
(with degassing of double circuit)

(4) **Catalysis**—at a normal fluxion (attaining 99.6% of recuperation of sulphur with a bisulphite installation in front of chimney)

(5) **Absorption**—Minimum output 99.5%
Total output based on total sulphur introduced into furnaces: 95% minimum.
Consumption of Kws: 40 per ton of acid produced.

INGENUITY AND IMAGINATION AT WORK FOR FARMER

Our mail brings in many interesting things, and we are frequently amazed at the ingenuity and the imagination being exercised in the interest of the farmer. Some of the stories are really just imagination. Some have a basis in fact. But whatever they prove to be, after serious agronomic study, they are interesting.

For example: From England comes a story about British agricultural experts and Dutch scientists getting their heads together to produce a new type lamp which is said to get better tomato crops — because it produces a lot of light and very little heat—which is what tomato seedlings are supposed to need. We knew a man once who put his sun lamp out in the yard where the grass was thin in the shade of a tree!

Down in Texas they are adding sawdust to the soil in nuseries, applying ammonium nitrate over the sawdust at 100 pounds per acre . . . and claiming the result, when disked in, doubles the seedling production capacity. They report the result is worth at least five successive cover crops.

The University of Wyoming agronomy department, we are told, are using oil shale to stimulate plant growth. Dry beans showed an increase of 500 pounds per acre after being sprayed with undiluted shale oil. With beans the oil acts like a harmone in stimulation growth and maturity. On other plants, growth abnormalities result. Research is indicated to determine which of the oil components does which.

The Gulf and Caribbean Fisheries Institute, meeting in Miami, were told recently that 45,000,000 pounds of protein-rich "trash" fish are annually dumped back into the sea, after being caught in shrimp nets. A pilot plant is being considered at Fort Pierce, Florida to test the market possibilities of making fertilizers for Florida growers.

Nitric acid is being milked from the air at high temperatures at two plants, one at San Jose, California, the other at Sunflower, Kansas. A special furnace produces nitrogen oxides, which are then recovered and concentrated. This process was developed by the Wisconsin Alumni Research Foundation.

The Connecticut AES is exploring an interesting research vein suggested by the fact that a wasp's venom is 100,000 times as toxic as DDT to certain insect larvae, enabling a tiny wasp to paralyze a big larva.

Chemical-resistant Glove

All purpose gloves, said to wear like leather but to cost little more than ordinary canvas gloves, and which have a special coating that shed moisture and resists chemicals, are offered by Mine Safety Appliances Company, Pittsburgh, Pennsylvania.

Acid Safety Goggle

A new acid-safety goggle named Duo-Chem, with a bright yellow frame, the standard code color for acid, is offered by United States Safety Service Company, Kansas City, Missouri.

TOMATOES

Sprays Not Enough

Foliar fertilizer sprays cannot meet requirements of most vegetable crops, according to Dr. Ernest L. Spencer of the Gulf Coast Experiment Station, Bradenton, Florida.

Dr. Spencer recently cited results of research indicating that it is practically impossible to provide enough nitrogen phosphoric acid, and potash for such crops as tomatoes through use of sprays. He also pointed out, that such sprays may prove beneficial in stimulating growth and production of vegetable crops.

The soils chemist reported no increase in yield from a planting of tomatoes given weekly spray applications of nitrate of potash or 13-26-13 fertilizer for seven weeks over another planting that did not receive either spray. Both plantings were side-dressed with 1,800 pounds of complete fertilizer per acre.

"The results of this test were not surprising, as investigations have shown tomatoes require about 67 pounds of nitrogen, 24 pounds of phosphoric acid, and 120 pounds of potash per acre to produce a normal crop of about 250 bushels per acre," Dr. Spencer explained.

"At the recommended rate of four pounds of 13-26-13 in 100 gallons of water, more than 13,000 gallons of spray per acre would be required to provide enough nitrogen; 23,000 gallons would be required to provide enough potash for the crop. And the strength of the spray cannot be increased because of the danger of leaf burn.

Another test when dry weather prevailed did result in an increase in tomato yield, and the Experiment Station worker expressed belief that in this case the spray provided the major elements in more available form than the fertilizer in the soil. Potash and urea sprays were used weekly in this test, and the yield was about 10 per cent higher than from tomatoes that received a side-dressing of 200 pounds of nitrate of potash during the period.

Use of the sprays during unfavorable growing weather also would limit the amount of fertilizer to be applied, as care must be exercised to avoid applying too much.

Dr. Spencer advised growers who may try using the sprays containing major elements not to combine them with pesticides, as the fertilizer reaction with the pesticide, may decrease effectiveness of the pesticide.

Tomatoes Respond To "Starter"

"Starter" solutions have increased yields of cannery tomatoes one and one half tons to the acre in tests carried on at the Experiment Station at Geneva, N. Y. They supply extra nitrogen, phosphorus, and potash to give the young plants a boost.

The starter is applied with the transplanting machine at the rate of one fourth pint to the plant. At present sufficient material to make enough starter solution to treat an acre of tomatoes will cost about a dollar and a half.

"There are several completely soluble materials now on the market for use in starter solutions," says Prof. C. B. Sayre, head of the Vegetable Crops Division at the Experiment Station. "These are more convenient to use than regular commercial fertilizers which contain considerable insoluble residue that must be strained out otherwise it will clog the tubes of the transplanter."

Starter solution materials are generally marketed in packages of three or four pounds, the amount recommended for use in 50 gallons of water. Formulas vary with different brands from 15-30-14 to 5-15-15. Regular 5-10-5 or 6-12-6 fertilizers may also be used at the rate of ten pounds in 50 gallons of water, providing the insoluble residues are strained off.

"The benefit of starter solutions is most marked at the first pickings of cannery tomatoes," says C. B. Sayre.
"They also give good results with other transplanted crops, including peppers, egg plants, melons, and cabbage. They are not likely to be of much benefit to market gardeners who follow more intensive fertilizer practices and who usually set out exceptionally well-nourished plants."

Tomatoes Need Elbow Room

Tomatoes need plenty of room, about 16 square feet to the plant, for maximum yields for cannery production, says Prof. C. B. Sayre, head of the Vegetable Crops Division at the Experiment Station at Geneva.

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Manufacturers of SULPHURIC ACID, SUPERPHOSPHATE, COMPLETE FERTILIZERS
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Citing the results of experiments with John Baer type tomatoes on the canning crops farm at the Station, he points out that the best yields were obtained where each plant had approximately this amount of space. Actually, varying the spacing between rows and between plants in the row made little difference. It was the overall space available to the plant that counted most.

The spray program for tomato disease control developed recently at the Experiment Station has led to a re-study of the best spacing of tomatoes, explains Professor Sayre. Provision must now be made for sufficient space between rows to move spraying equipment without danger of injury to the plants.

"The results of our tomato spacing experiments show that the plants can be set in rows, four, five, or six feet apart without reducing yields, providing the plants are set correspondingly closer in the wider rows," says the Station scientist.

"Most growers in New York State are now setting their tomatoes in rows five feet apart with the plants three feet apart in the row, or in six-foot rows with the plants two and a half feet apart in the row. The choice of planting distance depends upon the row spacing which best fits the spraying equipment available to the grower.

JANUARY IAC MEETING

The U. S. Department of Agriculture's Fertilizer Industry Advisory Committee met January 18 to discuss industry problems and the general outlook for fertilizers in connection with the tremendous production job before American agriculture in 1952.

Foremost among industry problems is the shortage of sulfuric acid for production of phosphate fertilizers, members of the industry group said. Industry spokesmen also questioned whether everything possible is being done to increase sulfur supplies and urged that all feasible steps be taken to get the critically short commodity from Mexico, Central America, or other possible supply sources.

National Production Authority representatives present said that their agency would do everything possible to see that phosphate fertilizer producers got their share of sulfuric acid within limitations of the present regulations governing that product and sulfur. They explained, however, that no improvement in the sulfur situation appears probable in the next few years.

Scope of the 1952 Production Goals Program of the Department was outlined to the industry committee at the beginning of the meeting by Harold K. Hill, deputy administrator, Production and Marketing Administration, USDA. He pointed out that the size of the job in 1952 will make the need for fertilizer more important than in 1951. W. A. Minor, assistant to the Secretary of Agriculture, pointed out that use of fertilizer in the United States had doubled in the last eight years and predicted similar increases in the years ahead. He urged the industry to take steps to meet the problems this expansion will bring.

Prospective supplies of basic fertilizers for 1952, as estimated by the Department, were given to the committee as follows: nitrogen, 1,375,000 tons, an increase of 7 percent over 1951; potash, 1,515,000 tons, up 5 percent from last pear; and phosphates, 2,100,000 tons, off 6 percent from 1951.

Industry spokesmen requested the Department to make a survey of fertilizer storage facilities from manufacturers right on through to farmers and to determine by crops and localities the best fertilizer formulas.

A suggestion was made by a Department spokesman that since ammonium sulfate was in freer supply than superphosphates, the former material could be used to raise the nitrogen ratios of mixed fertilizers, particularly for application on grains. Higher nitrogen content in mixed fertilizers for grains was urged, with the observation that in many instances a dollar spent for more nitrogen would return $6 to the farmer in increased yields.

Other Department spokesmen at the meeting included Jonathan Garst, Office of the Secretary; T. L. Ayers, Agricultural Conservation Programs Branch, PMA; W. R. Allstetter, Office of Materials and Facilities, PMA; and R. Q. Parks, Bureau of Plant Industry, Soils, and Agricultural Engineering, ARA. Speakers from NPA were G. M. Hebbard and P. H. Groggins, both of the Chemical Division. L. B. Taylor, director, Office of Materials and Facilities, PMA, was chairman of the meeting, and L. G. Porter, chief, Fertilizer Staff, OMF, vice chairman.

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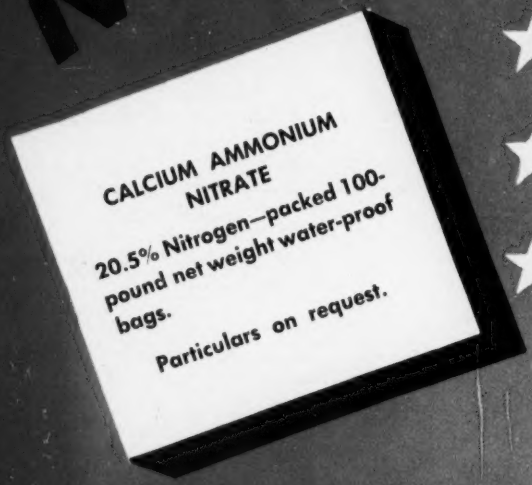

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